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[ORIGINAL COMMUNICATION.]

MENTHA AND UVA URSI.

BY JOSEPH SCHRENK.

MENTHA.—In his work on the anatomy of officinal leaves and herbs,* A. Meyer remarks on *Mentha piperita* and *M. viridis:* "The anatomical characteristics are little distinctive." I think that the occurrence of menthol crystals in the glandular hairs of *Mentha piperita*, and their absence in those of *M. viridis*, will enable us to distinguish the smallest fragments of the two drugs with almost absolute certainty. I have examined the leaves of spearmint collected in various localities, and was unable to detect any of the prismatic, needle-like crystals of menthol, which are found, sometimes singly, but most frequently in large conglomerations, in almost every glandular hair of *M. piperita*. As the crystals are doubly refractive, they can be seen very easily by means of the polariscope. In ordinary light it is often impossible to distinguish them. A fragment of the leaf is soaked in water, and may then be examined without any further preparation with a $\frac{1}{4}$ or $\frac{1}{6}$ in. objective.

It is remarkable how long these crystals will remain in the dried leaves. Fragments from an herbarium specimen gathered in Europe in 1827 contain them in as perfect a condition as leaves of plants collected quite recently.

FIG. 1.

Explanation of the Figures.—Fig. 1.—Upper part of inflorescence, in August, of Mentha piperita L. Fig. 2.—The same, of Mentha viridis L. Fig. 3.—Hair on leaf margin of A. Uva ursi. Fig. 4.—Lower cell of a hair, with adjoining epidermis cells. Fig. 5.—Junction of the two cells of hair.

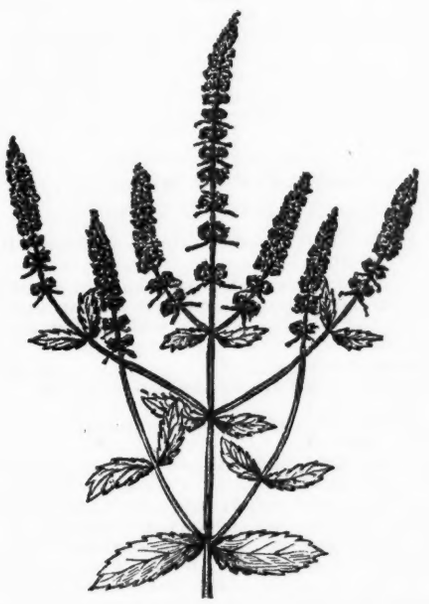
The pharmacognostical descriptions of Mentha refer to the histology of the *leaves* only. But as, according to our pharmacopœia, the *tops* also belong to the drug, it is perhaps worth while mentioning that the bracts of the inflorescence, as well as the calyx of *M. piperita*, are beset with numerous glands containing oil and menthol crystals. Even the lobes of the corolla are sparingly glandular on their outer surface.

Of other species examined (*rotundi*folia, aquatica, arvensis, sativa, canadensis) the only one which exhibited menthol crystals was *Mentha aquatica* L., both the type and the variety *crispa*. A specimen of the former, gathered in Germany about 1840, gave the same results as the leaves of its variety collected on Long Island in 1878, and those of an interesting hybrid of *M. piperita* × *aquatica*, obtained from C. Müller and W. Retzdorff (of the Berlin Agricult. Inst.).

In the German pharmacopœia "Folia menthæ crispæ" takes the place of our "mentha viridis" (which is considered as an adulteration of *M. piperita*†). There seems to be considerable diversity of opinion in regard to this variety "*crispa*," for, on consulting the authorities, we find that no less than *five* species are mentioned, each furnishing a variety of that name.‡ The majority of the authors, however,* consider it as a form of *M. aquatica*, L., of which species Wittstein† remarks, that of all the German mints it is probably the most efficient and hardly inferior to *M. piperita*. Further investigations will show whether the leaves of this variety *crispa* (*i. e.*, of M. aquatica) always contain menthol crystals or not, and whether, in case they do, the varieties of other species ought to be rejected. Thus far a few samples of the commercial imported "Folia menthæ crispæ" obtained from different sources have given entirely negative results.

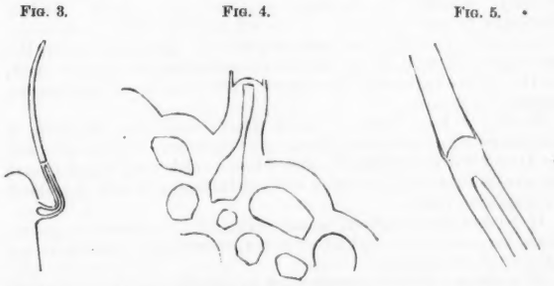
It seems to be doubtful if the crystals in the glands of *M. piperita* are pure menthol. Chemically pure menthol appears of a clear white in polarized light, while the crystals in the glands of *mentha* are distinctly yellow. This color might be caused by the oil in which the crystals are imbedded and through which the light has to pass; but even when the oil is removed the yellow color remains. More remarkable, however, is the fact that alcohol, in which menthol is easily soluble, does not dissolve the crystals, for leaves that have been kept in alcohol for several weeks have still retained them. Even heating in water up to the boiling point does not affect them, while menthol melts at about 40° C. Continued boiling, however, will remove them, although even then some glands will exhibit groups of unchanged crystals.

FIG. 2.



A peculiar difference in the inflorescence of the two species seems to have escaped notice thus far. With both, the spike of flowers terminating the main stem is much higher than all the lateral ones, at the *earlier* stage of flowering, in July. But when the terminal spike of *Mentha piperita* has done flowering (in August), it is soon overtaken and even overtopped by the lateral, lower branches, so that the upper part of the cymose inflorescence assumes the appearance of a corymb (Fig. 1). *Mentha viridis* does not behave in that manner, the terminal spike always remaining much higher than all the others (Fig. 2). Along the sides of a brook in Washington County, N. Y., where the two species grow intermingled in greatest abundance,

FIG. 3. FIG. 4. FIG. 5.



* "Anatomische Characteristik offic. Blätter und Kräuter," p. 39.

† A. Meyer, l. c.

‡ Lürssen (Die Pfl. d. Pharm. germ., p. 598) considers it merely as a form of *M. piperita*, var. glabrata. Wittstein (Pharmacogn. d. Pfl., p. 540) says that the "green" *M. crispa* is believed to be a variety of *M. viridis*, and the Linnæan M. crispa a variety of *M. aquatica*. In Huseman and Hilger's Pflanzenstoffe we find it mentioned as *M. sylvestris*, var. *crispa*. Hager (Com. z. Pharm. germ., p. 778) gives the following synonyms: *M. crispa* L., syn. *M. aquatica* L., var. *crispa* Benth. *M. crispa* Geiger, syn. *M. sylvestris*, var. *crispa* Benth. *M. crispata* Schrader, syn. *M. viridis* L., var. *crispa* Benth. There is also a *M. arvensis*, var. d *crispa*, Benth., etc., etc.

* Amongst them Flückiger, Pharmacogn., p. 686, and Mérme, Lehrb. d. Pharmacogn., p. 197.

† L. c.

I could tell the individuals belonging to either, by the difference described, from a considerable distance. Some herbarium specimens of *M. piperita* and also of *M. aquatica* that I have seen since show the same habit. It would be of interest to learn if the same observation was or will be made by others in different localities.

UVA URSI.—In his treatise on leaves cited above, A. Meyer states* that he found it impossible to detect the "one-celled, thin-walled hairs" on the leaves of Arctostaphylos Uva ursi Sprengel mentioned by Wiegand,† and that leaves from very different sources, and at various stages, were examined without any affirmative result. Even scars left by the falling off of hairs are said to be wanting. Vogl, in his beautiful "Anat. Atlas zur Pharmacognosie" (1887), does not mention or figure any hairs either.‡

I am unable to account for the difference in the results arrived at by such accurate observers as the authorities mentioned and those which I obtained. Leaves of Uva ursi collected by the writer in different localities, as well as those of the commercial drug, were found to possess abundant hairs on and near the margin, and along the midrib and its principal branches. The younger leaves, of course, and those from herbarium specimens, exhibited the hairs in greater profusion than the old ones or those of commerce; but even in the latter cases, their former abundant occurrence could be safely inferred from the scars they had left.

These hairs are not one-celled, however, but consist invariably of two cells (Fig. 3). The lower is of varying length, sometimes quite short, but sometimes one-third of the length of the entire hair (which is frequently one millimeter). It has very thick, cuticularized walls (Fig. 4), and is jointed to the long, thin-walled, and tapering upper cell (Fig. 5); this easily breaks off, so that, after much handling, only the lower cells remain which are wedged in between the strongly cuticularized walls of the epidermis cells. The hairs are either straight or curved or undulating in various ways.

[ORIGINAL COMMUNICATION.]

CARBOLATE OF MERCURY.

BY CHARLES ALBUS, PH.G., LOUISVILLE, KY.

Syn.: Phenol-Mercury, Phenate of Mercury, Hydrargyrum Carbolatum.

HAVING made numerous experiments to ascertain the best method of preparing this new compound of mercury, I give the following process which I found to be the best one:

Bichloride of Mercury	271 grains
Carbolate of Potassium (Phenol-Potassium)	264 "
Alcohol, Distilled Water, Carbolic Acid,	each a sufficient quantity.

Dissolve the Bichloride of Mercury in 8 fl. oz. of Alcohol. Into this pour the Carbolate of Potassium, previously dissolved in 2 fl. oz. of Alcohol; then add about ½ fluidrachm of Carbolic Acid and set the mixture aside for 36 hours, with frequent agitation. The precipitate first formed has an orange-red color, changing in the course of 36 hours to white. It is then put on a filter and washed with distilled water until the washings cease to give a violet-blue color with ferric chloride (showing absence of free carbolic acid) and a white precipitate with nitrate of silver (showing absence of any chloride). Finally, wash the precipitate with Alcohol, allow it to drain, and dry it by a gentle heat (between 90° and 100° F.).

Properties.—As thus obtained, it is a white amorphous powder, odorless and tasteless; insoluble in water, very sparingly soluble in alcohol, scarcely soluble in cold, but readily soluble in boiling hydrochloric acid. When strongly heated, it first gives off water, and is then decomposed, yielding, as decomposition products, metallic mercury, carbon, then some non-inflammable gases, and, lastly, some inflammable gases which burn with a bright, luminous flame.

Tests.—When treated with nitric acid and heated, it produces a permanent blood-red solution. If the powder be dissolved in boiling hydrochloric acid, and then 1 part of this solution be treated with solution of soda, a yellow precipitate falls.

If to another portion some solution of iodide of potassium be added, a bright red precipitate falls, soluble in an excess of the iodide.

If a copper coin be immersed in another portion, a coating of metallic mercury on the coin takes place.

On agitating a portion of the compound with water, the latter should remain unaffected by test-solution of nitrate of silver (absence of chlorides).

[Regarding phenol-potassium, see our vol. for 1887, p. 94.]

General Antidote.—Where the nature of a poison is unknown, the following is recommended: Equal parts of calcined magnesia, wood charcoal, and hydrated oxide of iron, with a sufficient quantity of water.—*Rundschau.*

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* P. 6.

† "Pharmacognosie," p. 229.

‡ The anatomical structure of "Folia Uva Ursi" is illustrated on Plates 6 and 7.

[ORIGINAL COMMUNICATION.]

A DELICATE TEST PAPER FOR HYDROCHLORIC ACID.

BY S. J. HINSDALE, OF FAYETTEVILLE, N. C.

THE test paper of which the mode of preparation is given below, is much more delicate than litmus, as it will, for instance, readily reveal the presence of 1 part of hydrochloric acid in 150,000 parts of water. To prepare it, proceed as follows:

Take *unsized* white paper of a neutral reaction, preferably the best, white filtering paper, cut it in pieces of about 6 by 7 inches, and impregnate it with Tincture of Turmeric made from 1 part of turmeric and 8 parts of alcohol. Hang the sheets up on threads, and when they are dry, pass them, one by one, through a bath composed of

1 part of freshly prepared Lime Water, and
1½ parts of Distilled Water.

This should be accomplished in 15 to 20 seconds. Then immediately pass each sheet, rather quickly, through a bath of *Water*, and hang it up to dry. When dry, the paper will have a deep orange color. Shallow dishes are best for the several baths through which the paper is to be passed.

The paper should be kept in a dry place, and should not be exposed to light. I prefer to keep it in a wide-mouthed bottle covered with paper. When dipped into a liquid containing even minute quantities of an acid, the moistened portion assumes a pure yellow color.

In *very* dilute solution, the change of color is not as rapidly brought about as in more concentrated ones, but, nevertheless, the reaction is more delicate than with litmus. With unboiled water it will produce the reaction either at once or in a short time, owing to the dissolved carbonic acid. After boiling, pure water will not affect the paper. If a free acid, therefore, is to be detected by means of this paper, the solution should be boiled to expel the carbonic acid. Then, if a yellow color is produced, some free acid (besides CO_3) must be present.

As the paper is liable to fade, it is best prepared as wanted. Ordinary turmeric paper, prepared as above directed, may be kept in stock. For use, a few sheets of this are first drawn through the diluted lime-water, afterwards through water, according to above directions, and the paper quickly dried.

Solvents of Urinary Calculi.

DR. HERMAN GOLDENBERG of N. Y., has studied the effect of various solvents upon urinary calculi, with a view to ascertain the most favorable method of treatment of lithiasis, under different circumstances. Instead of performing his chief experiments in a test tube, by trying the solubility of uric acid, or uric acid concretions in solutions of various supposed litholytics, he treated the uric acid, etc., with urine passed by persons who had purposely taken regular doses of the litholytic remedies, and made a parallel set of experiments with normal urine not containing the latter.

It was found that the greatest solvent action was exerted by the waters of the Désirée spring of Vals, 100 C.c. of urine passed under the daily administration of one bottle of this water being capable of dissolving about 0.01 Gm. of uric acid. The "Grand Grille" of Vichy possesses nearly the same power. Next come Fachingen, the Helenen-quelle of Wildungen, and finally, the Obersalzbrunn Kronenquelle. The latter has only one-fifth the solvent power of the Désirée.

It is now pretty certain that the main factor in the litholytic power of the waters is the percentage of carbonate of sodium.

Experiments to substitute aqueous solutions of this salt, in such strength as to resemble the natural waters, had similar effects upon the calculous deposits, but caused disagreeable effects upon intestinal peristalsis, and by rendering the urine alkaline, produced an abundant precipitation of phosphates. Similar effects were produced by *Catani's powder*, which is composed of:

Lithium Carbonate	1 part
Sodium Bicarbonate	2 parts
Potassium Citrate	4 "

also, to a less extent, by magnesium boro-citrate, which, however, is well borne in long-continued doses.

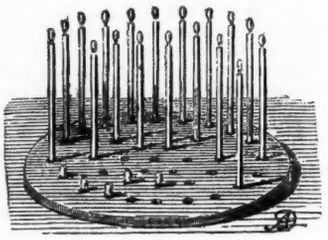
The author advises, in acute cases, to employ the most active remedies, particularly such mineral waters as contain the largest amount of sodium carbonate. But these should not be long-continued. In chronic cases, the milder remedies are to be preferred, and aside of mineral waters, the most beneficial or least harmful appears to be the boro-citrate of magnesium.—After *Med. Record.*

Sodium Sesquicarbonate is a new salt, which has been put on the market by English manufacturers as a substitute for ordinary sal soda, over which it has the advantage of a much smaller amount of water of crystallisation. The composition is $Na_2CO_3.NaCHO_3.2H_2O$, and is therefore a combination of 1 molecule of sodium carbonate, 1 mol. of sodium bicarbonate, and 2 mol. of water. It is very soluble, and is readily prepared of great purity. It is obtained by bringing together a solution of sal soda and carbonic acid gas in proper proportions, and crystallizing the solution at a temperature above 35° C.

CAPSULES AND CAPSULE-MAKING.

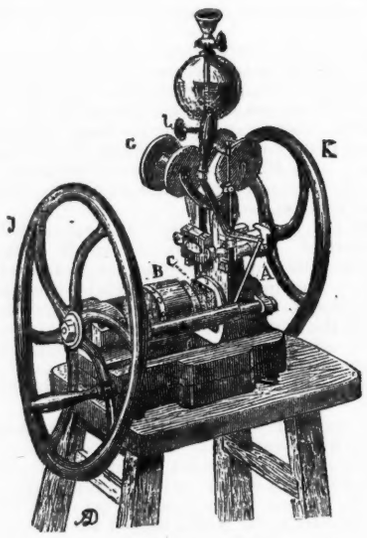
We owe this particular form for the administration of medicines to Mothes, who invented gelatin capsules in 1838. They afford one of the best means of administering nauseous medicines, especially liquids, and for this purpose their use has gradually extended. If it were known that a dozen capsules could be made in as short a time as is required to make a dozen suppositories, we feel sure that every pharmacist would add this branch of the pharmaceutic art to his every-day employment.

The details of the operation of capsule-making are, as will be seen from the description which follows, comparatively simple. The requisites are moulds, or olives, as the French call them. These are egg or olive shaped, solid heads of iron or britannia metal, each of which is fixed upon a metal rod; a dozen or more of the moulds are fixed into a slab of wood or cork, with perforations for the purpose, and at the back of the slab, in the centre, a handle is fixed. A good slab or holder may be made from a large cork bung. The appearance of the moulds fixed on the holder is seen in the following figure:



Moulds for soft capsules.

The moulds are the only part of the requisite apparatus which are not home-made. A slab of wood with quarter-inch perforations bored with a centre-bit (the holder as shown, for example), or even a suppository mould, serves to support the capsules in the process of filling, and most liquids are poured into the capsules by means of an ordinary glass syringe. The fifteen-minim capsule is the common size, but the size may vary from five minims to one or even two drachms. If the moulds are made locally, the chemist should supply the moulder with the shape from which to work. For this purpose use clean yellow wax, fifteen grains for each fifteen minim mould; warm the wax and form it into the proper shape, with as smooth a surface as possible. The moulder will of course make the metal mould perfectly smooth; the slightly greater bulk, proportionately, of the wax allows a fair margin for this purpose.



Capsule-making machine.

A form of capsule which is very popular in France is the perle, or globule. They are either spherical or flattened forms of the capsule, and are made in a different way. Viel's apparatus for making these, as perfected by Thevenot, is shown in the accompanying figure.

A is the cast-iron bed or support of the machine resting upon a strong deal table; B, a hollow movable cylinder, has a moulding plate at its extremity corresponding to C. To these, bands of a gelatinous film are conveyed from the spools G. The liquid to be capsuled is placed in the receptacle H, from which it passes to the capsule. The whole apparatus is worked by means of the wheels J, K; J forms the gelatinous moulds, and K works the apparatus which closes the moulds. The gelatinous film referred to is made of Irish moss mucilage dried. The moulds turn out the two parts with edges which are subsequently made to adhere by strong pressure of a part of the apparatus worked by the wheel K, and which consists essentially of a counterpart of the capsule made of steel.

Capsules are either hard or soft. The former were the first introduced, but the latter are now deservedly the more popular, for they are more easily swallowed. The solution for hard capsules is made according to the following formula, although the quantity of liquid used in this and other cases must vary with the quality of the gelatin:—

	Oz.
Gelatin	6
Gum acacia	1
Powdered sugar	1
Water	5

Steep the gelatin in the water, when soft add the gum and sugar, and heat until dissolved, removing any scum which rises to the surface.

Various formulas have been proposed for the soft capsules. The following have been found to give good flexible masses:

		Parts.
(1)	Gelatin, gum acacia, sugar, each	30
	Honey	10
	Water	100

Make a solution as above.

		Parts.
(2)	Gelatin	25
	Glycerin	10
	Sugar	8
	Water	45

Steep the gelatin in the water, add the sugar and glycerin, and dissolve by the heat of a water-bath.

A stock of No. 2 may be kept and dissolved as required by means of a water-bath. To make the capsules, have the gelatin mixture melted and heated to 104° F.; prepare the moulds by oiling them very slightly with olive oil. This is best done by oiling a soft cloth, such as a piece of lint, and applying this over the whole of the mould surface and a little way up the supporting-rod. Lift the mould-holder by the handle and immerse the moulds completely in the gelatin mixture; in a few seconds remove steadily and begin to rotate the moulds in a circular fashion, so that the gelatin may set perfectly even. A little practice suffices to make the operator perfect in this operation. In a couple of minutes the gelatin has set sufficiently to allow the whole to be set aside. In about a quarter of an hour the capsules may be removed by grasping each lightly with the finger and thumb and gently pulling off. Place each one upon its closed end in one or other of the supporters already described, and when the whole have been removed cut off their tails with a pair of scissors. They are now ready for filling, and in the case of liquids this is simply done with a syringe; for powders use a small funnel made of paper. The open end is closed by dipping a glass rod in the liquefied gelatin solution and placing the drop which it removes upon the open end. Sometimes a superior finish is given to the capsules by afterwards dipping this end of the capsule half-way up the gelatin solution and drying rapidly, but one must be an adept before this refinement is attempted. After they are finished it is necessary to expose the capsules to the air for a few hours, in order to dry them thoroughly.—*Chem. and Drugg.*, April 14th.

A New Antiseptic Soap.

At a recent meeting of the Society of Chemical Industry held at Edinburgh, Mr. John Thomson reported on the results of his experiments on the preparation of an antiseptic soap.

The mercuric salts being so powerfully antiseptic, the author experimented with a number of them, but found only one of them to resist decomposition when introduced into soap. This salt was the red iodide (biniodide), which has long been known to be more powerfully antiseptic than even the bichloride. Biniodide of mercury combines with soap of almost any kind without in any degree losing its antiseptic properties. A variety of soaps prepared by the author and containing mercuric iodide were tested by several bacteriologists and were found to be most efficient. The tests were made by introducing silk-threads impregnated with various septic material (of known origin) into a solution of the soap of known strength (usually 1 in 120) and leaving them there 10 minutes, which time was sufficient to render them perfectly aseptic.

The biniodide soap has been tried in the treatment of cases of eczema with most marked success, especially where the irritation has been produced by the fermentation of accumulated secretions.

It has also been used in parasitic skin diseases, such as favus and ringworm, with marked success.

The biniodide soap contained from 1 to 3 per cent of biniodide, dissolved in iodide of potassium.—*Journ. Soc. Chem. Ind.*, 1888, 192.

Notes on Opium Assaying.

AT the request of Dr. William K. Newton, the New Jersey State Dairy Commissioner, a series of investigations was undertaken for the purpose of determining the relative value of several of the more recent and best reputed methods of assaying opium and its preparations. The principal object was to ascertain that method which, being at the same time the most convenient and least liable to error on the part of the analyst, would give accurately the proportion of morphine, when the same fell within a reasonable limit above or below the legal standard, rather than to seek for a method which would give most accurately the percentage of morphine, *whatever* its amount.

The processes which were thus studied by the author, assisted by L. W. McCay, D.Sc., were the following, in which the description of the manipulations is given in a condensed form:

I. *Squibb's Method.*—The opium is thoroughly extracted with cold water, the solution is concentrated to a small volume, alcohol is added, then ether, and finally ammonia. The precipitated morphine (after the aqueous solution has first been washed with more ether) is collected on a filter placed within another of equal weight, crystals and filter are washed successively with a little ether and then water, the filters and morphine dried at 100° C., using one filter to counterbalance the other. A portion of the weighed morphine is treated with lime-water and any undissolved residue is deducted from the weight of the morphine. The method is a modification of a process devised by Flückiger, and resembles that of the German Pharmacopœia, II.

2. *Stillwell's Method.*—This is based upon Squibb's, from which it differs mainly by the use of saturated solutions of morphine in alcohol with a little ammonia, and in water, to more thoroughly wash the precipitated morphine, and in the use of hot alcohol to separate the weighed morphine from the impurities insoluble in the alcohol.

3. *Method of the United States Pharmacopœia.*—This is one of the various lime methods; the opium is extracted by digestion with slaked lime and water; an aliquot portion of the filtered solution is shaken with alcohol and ether, then chloride of ammonium is added, and after washing the aqueous solution with more ether, the precipitated morphine is collected on a filter placed within a counterbalanced filter, the filter is washed with a little ether, and then the crystals of morphine are transferred to the filter and washed with a little water. When dry, the filters and morphine are weighed, using one filter to counterbalance the other.

4. *Dieterich's Method* (known as the "Helfenberg" Method).—The opium is extracted with cold water, an aliquot portion of the filtered solution is treated with a slight excess of ammonia and at once filtered off from the precipitated narcotine and other organic matter; an aliquot part of this second filtrate is mixed with ether and then with more ammonia, and after washing the aqueous solution with more ether, the precipitated morphine is collected chiefly in the precipitating flask and partly on a small filter; washed with a little water saturated with ether, and then dried and weighed, the morphine being brushed from the dry filter into the flask for weighing.

5. *A Modification of Dieterich's Method, devised by the Author*, in which, instead of using an aliquot portion of the aqueous extract of opium, the whole of the solution is used, after the opium has been thoroughly extracted with water as directed in Stillwell's method.

6. *Kremel's Method.*—The opium is extracted with lime-water, an aliquot part of the filtered solution is treated with ether and ammonia, and the rest of the process conducted nearly as in Dieterich's original process.

We shall not reprint here the author's detailed report on processes Nos. 1 and 2. Regarding process No. 3 (that of the U. S. Ph.), Prof. Cornwall states that, when very carefully executed, it gave better results than was anticipated on theoretical grounds. He desires, however, to draw attention to the very considerable difference in results which the operator has it in his power to obtain with the precipitated morphine, according to the way in which he follows the U. S. Ph. directions as to "pressing it between sheets of bibulous paper," before drying it at an elevated temperature.

The results come out about 0.4 per cent lower in the cases when the morphine crystals and filters were pressed between paper *until they would give up no* trace of moisture to the bibulous paper, than when they were simply pressed so as to merely render them dry to the eye. To obtain proper results, the pressing must be most thorough. The U. S. Ph. method is liable to variations, depending largely on the care and fidelity of the analyst, and it is moreover not as convenient a method as that presently to be described.

The author then described Dieterich's two methods (summarized under 4), and then gives his own modification of Dieterich's process.

He had ascertained by careful experiments that it possessed very important advantages. With laudanum (*i. e.*, a liquid which holds the morphine in solution) it succeeded extremely well. But with opium it gave low results, even allowing for the morphine which the mother liquor could have held in solution. The probable cause appeared to be imperfect extraction of the opium. On changing the method of extraction to that recommended by Stillwell, very satisfactory results were obtained.

Cornwall's Modification of Dieterich's Process.—Place 6 grammes of opium in a beaker, add 60 C.c. of water, stir occasionally (breaking up all the lumps), and finally let stand, covered, over night for twelve hours. Filter into a graduated cylinder, wash the residue on the filter until the filtrate and washings amount to 75 C.c., and set this aside. Carefully return the residue to the beaker, stir well with 20 C.c. of water, let stand ten minutes, and filter through the same filter; repeat the operation twice more, each time with 12 C.c. of water, finally pressing the residue with a glass rod. Evaporate the last three washings, about 44 C.c. in all, in a dish 4 to 6 inch. diameter, on a water-bath below boiling heat. When down to about 15 C.c., add the first strong extract, rinsing the cylinder with a little water, and evaporate the whole to exactly 50 C.c., including the water necessary to rinse the solution into the measuring cylinder. [We would have said: add the first strong extract, wash the cylinder with a little water, and evaporate the whole to a volume somewhat below 50 C.c. Then allow it to become cold, and add enough water to make exactly 50 C.c.—ED. AM. DRUGG.]

Add of normal ammonia, 2 C.c. (plus the amount necessary to exactly neutralize the dilute sulphuric acid, if any such had been added—in the writer's case this was 0.5 C.c.), mix thoroughly and at once filter, as directed in Dieterich's original process. Of this filtrate take a volume corresponding to 4 grammes of opium. In the writer's case, this was of course obtained by the proportion—$6:4::52.5:x$ $=35$ C.c. In general it would be—$6:4::50+a:x$; a denoting the number of C.c. of normal ammonia already added.

To this portion of the filtrate add 13 to 14 C.c. of ether, mix by rotating the flask, and then add 4 C.c. of normal ammonia as directed in Dieterich's original process exactly according to which the assay is now to be completed.

The writer's results in three trials with the opium were: 13.23,* 13.40, and 13.20 per cent.

In the last trial the extraction was made with one-half more water, including first extract and washings, than in the others, indicating complete extraction with the smaller quantity of water. In the last trial the opium was also rubbed very fine with some of the water at first. These results confirm the objections made by Squibb and Stillwell to the use of aliquot parts of aqueous extracts of opium to represent the whole of the morphine present in the opium. In applying Dieterich's methods to tinctures and officinal extract of opium, of course no such objection exists.

By this simple modification, Dieterich's process for opium is brought into agreement with other methods of acknowledged accuracy, while its convenience in comparison with them may well be likened to the superiority of volumetric over gravimetric methods of analysis. The tedious and risky weighing, washing, and drying of bulky precipitates and filter papers is reduced to the simple handling of a small flask and an easily dried, highly-crystalline precipitate.

We have not had time to test the applicability of Dieterich's method, thus modified, to poor opiums, but in view of its results with laudanum, as compared with those of the U. S. Pharm. method (which is there at its best), there is no doubt that it embraces a range wide enough to cover all the variations of the average grades of opium, or that it is admirably adapted to determine whether an opium preparation is below the the legal standard.

Prof. Cornwall concludes his paper with the following summary:

Squibb's method, owing to the limited washing, is liable to give too high results.

Stillwell's method provides the means of arriving with certainty at correct results, with opium of any grade.

The U. S. Pharm. method, while open to theoretical objections, appears to be well adapted to opium of average quality, if very carefully executed; it is less liable to error in the case of officinal extracts and tinctures of opium than with opium itself.

Dieterich's methods, as improved by himself, are accurate for officinal extracts and tinctures, but still too low in the case of opium.

Dieterich's method, with the complete extraction finally adopted by the writer, gives accurate results for opium, and is the method least liable to error in comparatively unskilled hands.

Kremel's method gives too low results for opium, and is in any case inferior to Dieterich's, both as to accuracy and convenience.

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* No dilute sulphuric acid was added in this first trial during the extraction. The argument of the results shows that the larger percentages obtained by the writer with Squibb's method were not due to the use of acid.

AUTOMATIC STILL.

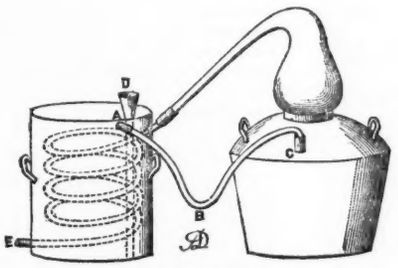
REFERENCE has recently been made in the columns of the *Pharmaceutical Journal* to automatic stills, or stills that might be made automatic.* The arrangement here described is one that may readily be adapted to, and is specially suited for, the old-fashioned stills which are in frequent use among pharmacists for the purpose of distilling water. The idea is extremely simple, but I can testify to its thorough efficiency in actual practice. The still is of tinned copper, two-gallon capacity, and the condenser is the usual worm surrounded with cold water.

The overflow of warm water from the condenser is not run into the waste pipe as in the ordinary course, but carried by means of a bent tube A, B, C to the supply pipe of the still. The bend at B acts as a trap, which prevents the escape of steam.

The advantages of this arrangement are obvious. It is perfectly simple, and can be adapted at no expense. It permits of a continuous supply of hot water to the still, so that the contents of the latter may always be kept boiling rapidly, and as a consequence, it condenses the maximum amount of water with the minimum of loss of heat. If the supply of water at D be carefully regulated it will be found that a continuous current will be passing into the still at a temperature of about 180° F.: or if practice suggest the desirability of running in the water at intervals, this can be easily arranged. It is necessary that the level at A should be two inches or thereabout higher than the level of the bend at C, otherwise there may not be sufficient head to force a free current of water against the pressure of steam. It will also be found that the still should only contain water to the extent of about one-fourth of its capacity when distillation is commenced, as the water in the condenser becomes heated much more rapidly than the same volume is vaporized. By this expedient a still of two-gallon capacity will yield about half a dozen gallons per day, a much greater quantity than could ever be obtained under the old system, which required the still to be re-charged with cold water every time 1½ gallons had been taken off.

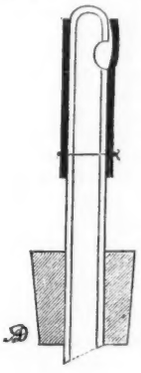
The objection to all such continuous or automatic arrangements is, of course, that the condensed water contains all the free ammonia that may have existed in the water originally, but it is only in cases where the water is exceptionally impure that this disadvantage will become really serious. The method here outlined has no doubt occurred to many, and may probably be in regular use, but not having seen any previous mention of the idea I have thought that it might be useful to some pharmacists who prepare their own distilled water.—T. MABEN in *Pharm. Journ.*

Automatic filter.



Maben's automatic still.

Witt's funnel.



Safety-vent.

AUTOMATIC FILTER.

THE apparatus figured here has recently been introduced in France, its purpose being to overcome some of the difficulties which accompany the use of ordinary funnels. The advantages claimed for it are (1) that filtration goes on regularly without the introduction of a foreign body between the stem of the funnel and the neck of the bottle [?]; (2) the flow of liquid stops automatically when the liquid reaches a certain height in the bottle, so that overflowing is impossible; and (3) the funnel may be taken from one vessel to another without the loss of any of its contents. The parts of the apparatus are: V, a tin tube lined with vulcanized india-rubber, into which the extremity of an ordinary funnel is fitted; R, a stop-cock; C, an india-rubber stopper for fitting into the neck of the receiving vessel; T, a tube connecting through the stop-cock with V, *t*, a small tube to allow the escape of air from the receiving vessel as filtration proceeds; to this is attached a piece of india-rubber tubing with a hook whereby it may be attached to the funnel. When the liquid in the vessel reaches *t*, it flows up the tube, thus stopping the exit of air, and filtration ceases.—*Chem. and Drugg.*

* *Pharm. Journ.* [3], vol. xviii., p. 777.

SAFETY-VENT.

WHEN solutions are to be prepared without access of air, the stopper of the flask may be provided with a tube having the shape of that shown in the cut. The upper end of this is closed by fusion, and a lateral hole blown into it near the end, a piece of rubber tubing being slipped over it. Any excessive pressure in the interior will find relief by lifting the rubber valve, while pressure from the outside will render it only more impermeable.—After *Zeitsch. f. Anal. Chem.*, 1888, 178.

NEW FUNNEL.

O. N. WITT some time ago described an improvement for funnels, consisting of a perforated plate of glass, metal, or porcelain which was to be laid in the funnel, and over which a filter-paper was to be laid, which was to be held in place by a second filter.

This arrangement, which is used very largely in factories and laboratories, has the disadvantage that the filter is generally not tight, so that the filtrate runs through cloudy, at least in the beginning.

To obviate this difficulty, Dr. R. Hirsch has caused porcelain funnels to be made, in which the perforated plate is permanent fixture. In these funnels, only *one* filter is required, and the funnel may be emptied or refilled without risking the displacement of the plate, as is the case with Witt's funnels.

The appearance of the funnel, as heretofore constructed of glass, is shown in the cut. The porcelain funnel has the same construction.—*Zeitsch. f. Angew. Chem.*, 1888, 160.

Indian Sarsaparilla (Hemidesmus).

AT a recent drug sale in London there came up for disposal a number of packages of hemidesmus, or Indian sarsaparilla root, which comprised the first consignment of the drug received here after a rather unusual interval of thirteen years. It was perfectly natural, therefore, that before these packages came up for sale the drug should have been reported to be scarce—indeed, it was unobtainable, but as retail druggists are so rarely called upon to supply either the root or its preparations, the fact that the drug is scarce or otherwise is not likely to create much excitement. Yet it happens that in St. Bartholomew's Hospital, the largest medical institution in the metropolis, Indian sarsaparilla takes the place of the smilax root, so that all preparations of sarsaparilla used therein are characterized by the absence of what is generally known as sarsaparilla, and the hospital has the distinction of using more hemidesmus than all other consumers put together. Before the last arrival the hospital stock became exhausted, and one of the customs of the institution appeared to be threatened with extinction. The physicians of the hospital report that they find the preparations of hemidesmus to be as satisfactory as those of sarsaparilla. That is, perhaps, not saying much; nevertheless, when Dr. Ashburner introduced it in this country in 1831 it was said to increase the appetite, to act as a diuretic and improve the general health, plumpness, clearness and strength succeeding to emaciatiation, muddiness and debility. It was also said to be useful in affections of the kidneys, scrofula, cutaneous diseases, and thrush. It had long been used in India, where it is held in high reputation, and is known under the name of *Nannári root* and *Ananto-múl*. It is the root of *Hemidesmus Indica*, which is the same plant as the *Periploca Indica* of Willdenow and the *Asclepias pseudosarsa* of Roxburgh. The root has a strong odor resembling tonka bean, this characteristic being particularly marked in the recent consignment.

"**Listerin**," according to *Fortschritt*, consists of: Benzoic acid and borax, each 8 grammes; boric acid, 16 grammes; thymol, 2.4 grammes; eucalyptol and oil of wintergreen, each 10 drops; oil of peppermint, 6 drops; oil of thyme, 2 drops; alcohol, 180 grammes, and sufficient water to make 1,000 grammes.

Notes on Commercial Drugs and Chemicals.

(From Gehe & Co.'s Handelsbericht, f. April, 1888.)

Acetanilid (Antifebrin).—The consumption of this antipyretic is quite large. It has been called, not without reason, the "antipyrin for the poor," as it is capable, in very many cases, to replace antipyrin perfectly, either by its power to reduce temperature, or by its specific effects in articular rheumatism, migraine, or neuralgia. It is certain to retain its place in the materia medica, though the time may arrive when it will be no longer deemed so important to reduce the temperature of the body.

The melting point of pure, dry antifebrin lies between 112°–113° C., its boiling point at 295° C. In determining the latter, it will be noticed that every commercial brand of acetanilid (or antifebrin) will assume in the retort, when kept during about fifteen minutes at the boiling point, a series of colors beginning with yellow and passing through rose into brownish-red. This coloration is accompanied by a decomposition of the contents of the retort, which may easily be ascertained, after cooling, by their odor and reactions. How far this decomposition depends on the presence of traces of pseudo-toluidine, or rather its acetyl compound (corresponding to acetanilid), has not yet been determined.

Alpha-Oxynaphthoic Acid.—This new acid is now obtainable in the market, and has been pronounced to be a very powerful antiseptic and antizymotic It cannot be used as a substitute for salicylic acid, for the purpose of preserving food, as it is rather poisonous. But it is supposed that it may be used internally in diseases of the intestines and febrile diseases when prescribed by physicians. Its chief field of usefulness will, however, be that of disinfection. [The long name would eventually have to be curtailed, to popularize the substance. Probably "Naphthoic Acid" would be sufficient.—ED. AM. DR.]

Alum Pencils.—Gehe & Co. now manufacture also *vaginal balls* of alum.

Aluminium.—The electrolytic method of preparing aluminium has not yet been brought to such a point that the metal can be sold at materially reduced prices. At present, aluminium is chiefly used in the manufacture of bronzes and for physical and optical instruments, being here usually alloyed with a little silver. If it should, however, be possible to bring the cost of preparing it down to about 1 dollar per kilo, its employment would become so universal that it would revolutionize the metal industry.

Anthrarobin.—This new chemical, prepared by Prof. Liebermann as a substitute for chrysarobin, and regarding which our readers will find a detailed account on page 62 of our last April number, is now on trial. It is said to act more slowly than chrysarobin. It is almost insoluble in water, but soluble in about 10 parts of absolute alcohol; also in 10 parts of glycerin at 100° C. It is usually applied either in form of ointment (containing 10 to 20%), or as 10% tincture or in solution in glycerin.

Antipyrin.—The statements made by Prof. Germain Sée, regarding the anodyne and analgesic action of antipyrin, have been declared by several competent authorities to be exaggerated. It is not denied that the effect, as claimed, is produced, but its duration is asserted to be only temporary; and besides, if frequently used, the remedy often fails to give relief altogether.

The manufacturers of antipyrin supply it both in the crystalline form and in powder.

Balsam Peru.—Gehe & Co. report that Denner's test, first announced at the late meeting of Naturalists at Wiesbaden, for the detection of benzoin and storax in balsam of Peru, has been found by them to be very valuable. On first appearance the test is very circumstantial, but when only the presence (not the quantity) of the beforementioned adulterants is to be demonstrated, the test may be shortened in the following manner:

Mix 5 Gm. of balsam Peru, 5 Gm. of solution of soda (containing 15% NaHO), and 10 Gm. of water in a test tube. Shake the mixture with 2 successive portions of 15 Gm. of ether, and decant the ether each time as far as possible. Heat the residue to boiling and acidulate it with hydrochloric acid. Then add cold water, and remove the resin which separates from the liquid. Dissolve this resin in 3 Gm. of solution of soda (15%), dilute with 20 Gm. of water, heat to boiling, and precipitate with solution of chloride of barium. Transfer the precipitate to a filter, drain, dry it in a water-bath, and extract it with alcohol. Evaporate the alcoholic solution, dissolve the residue with concentrated sulphuric acid, add chloroform and shake. If benzoin or storax had been added to the balsam, the chloroform will assume a violet to blue color. Even small quantities of the adulterants are still recognized by this test.

Cardamoms.—In 1880–81, the export from Ceylon amounted to only about 16,000 lbs. In 1885–86, it has risen to 236,050 lbs., and in 1886–87 to 321,560 lbs. "Long" cardamoms are scarce; the variety usually cultivated is that known as Malabar and Aleppi.

Chinotoxine—a name applied for convenience's sake to a synthetic compound, viz., dichinolindimethylsulphate —has been found to possess properties similar to that of curare and "curarine." Gehe & Co. do not seem to have much faith in its vitality.

Cola-Nuts reach the market in larger quantity than formerly. As they contain both theobromine and caffeine, they are beginning to attract more attention. It is difficult to transport them without spoiling, as they cannot be thoroughly dried at the place of production.

Creosote is coming into increased use as a remedy in phthisis. It is now being administered also hypodermically in form of a 3-per-cent solution in oil of almonds.

Cubebs.—It is not improbable that the present value of cubebs will not be maintained much longer, since more attention is now paid to the cultivation and collection of the drug in Java. The demands made upon the quality of cubebs are not alike in all countries. It is, therefore, often difficult for the dealer to comply with all requirements. While in Germany the requirements of the pharmacopœia are considered as sufficient, in other countries the additional requirement is made that, when cubebs are triturated with sulphuric acid, they should assume a purple color. The failure of this reaction is regarded as a proof of their spurious character. But, in fact, the test only shows the presence of cubebin, while both the essential oil and cubebic acid may have been extracted from the drug. Gehe & Co. report having seen cubebs which but little resembled the officinal drug. They were small, shrivelled, scarcely 1.5 millimeters in diameter, with a stem 2 or 3 times as long, and evidently gathered in the first stage of fruiting. Yet, as they yielded a larger percentage of extract, they commanded a higher price.

Ethyl Bromide, which had of late been again recommended as a substitute for chloroform, does not seem to have found universal favor, even in its purest state.

Guajacol.—In place of creosote, which has found employment as a remedy in phthisis, Sahli has commenced to use one of its constituents, viz., pure guajacol (or guaiacol), which is administered in the following form:

	Gm.	
℞ Guajacol	1.2–2.0	gr. 20–30
Aquæ Destill	180.	fl. ʒ 6
Alcohol	20.	fl. ʒ ½

Dose: A teaspoonful 2 or 3 times a day, in water, after meals.

Absolutely pure guajacol may now be had in the market. The usual commercial article often contains only about 35 per cent of it. Its purity may be determined by its spec. grav., which is 1.117 at 15° C., and by it being insoluble in 2 vol. of glycerin (sp. gr. 1.19), and in 2 vols. of benzin. It boils at 200°–202° C.

Guarana has reached the market again in sufficient quantities. It is not in active demand at present, probably owing to the cheapness of caffeine.

Hydrochloric Acid.—Wherever the new ammonia process for the manufacture of sal soda has been introduced, the commercial value of hydrochloric acid (which is not obtained as a by-product in this process) has materially advanced. [This is not yet the case in this country, but is likely to occur within the next five years.—Ed. AM. DR.] Efforts have been made during a number of years to utilize the immense quantities of solution of chloride of magnesium which are obtained at the Stassfurt mines as a waste product. A special aim has been to substitute magnesia for lime in the regeneration of ammonia from the chloride of ammonium produced during the conversion of the chloride into the carbonate of sodium. If this succeeds, as there is reason to expect, and the chloride of magnesium can also be utilized to generate both chlorine and hydrochloric acid, a complete revolution in this branch of chemical industry will be brought about.

Hydroxylamine Hydrochloride.—The strongly reducing action of this compound, which places it side by side with pyrogallic acid, renders it not improbable that it will be found to possess valuable properties for the treatment of such skin diseases as are amenable to pyrogallic acid and other reducing agents in general.

Iodol has been only in moderate demand, no doubt owing to its high price. If the alleged successful employment of *salol* in place of iodoform should turn out to be authentic, neither iodol nor iodoform would have a very hopeful future. The two compounds *sozoiodol* and *iodaseptol* (respectively, iodo-paraphenol-sulphonic, and iodo-orthophenol-sulphonic acid) have so far been but little used.

Iron Reduced.—Gehe & Co. state that there is no reduced iron in the market which is entirely free from sulphur.

Morphine.—The production of this alkaloid is at present larger than the market can absorb. In former years, both the Persian and East-Indian opium were absorbed either by consumption at home or by export to China, but since the latter country produces nearly all the opium it requires itself, the above-mentioned varieties of commercial opium begin to make themselves felt as factors in the morphine industry.

Olive Oil.—Regarding the adulteration of this oil with seed oils and particularly with refined cotton-seed oil, many reports have recently been received from Italy. It

is said that Lucca oil, in flasks, which is a favorite brand in England (and also in the U. S.), consists often only of cotton-seed oil. From Nizza it is reported that cotton-seed oil, bleached and rendered odorless, is simply mixed with 20 to 25% of fine olive oil, and put on the market as "huile à manger." It is said that this kind of oil, when used for dressing salad, runs off the lettuce leaves, while genuine oil of olive adheres to them and "combines" with the vinegar. [We doubt this.—ED. AM. DR.]

Phenacetin.—This new antipyretic has found much favor. According to present reports, 1 Gm. of it has about the same effect upon the temperature of the body as 2 Gm. of antipyrin, or 0.5 Gm. of antifebrin. It is just as free from disagreeable secondary symptoms as antipyrin; and particularly does not produce the cyanosis so often occurring with antifebrin. Used as an antineuralgic, it calms and deadens pain much more energetically than antipyrin, and is of great benefit in migraine, insomnia, and neurasthenic affections. It may therefore be regarded as an intermediary link between antipyrin and antifebrin.

Picric Acid appears to be still used for the manufacture of explosives for war purposes, though it is not known exactly in what manner. This seems to be, at least in part, the reason why the price of carbolic acid has not experienced a very material decline.

Quinine and Salts.—The question of what is the best test to determine the purity of sulphate of quinine has been well discussed during the past year, but has not been thoroughly settled. It is pretty certain that the final choice will much depend upon the decision of pharmacologists, as to what percentage of cinchonidine (or other cinchona alkaloids) may be left in commercial sulphate of quinine without interfering with its therapeutic value. Supposing that they were to decide that an amount not exceeding 2.5 per cent may be tolerated, then Schaefer's oxalate test will probably be preferred as the most simple one. Should a larger percentage be tolerated, and the test afford at the same time an approximate quantitative estimation, the modified Kerner's test (see our last January number, page 8) will probably be preferred. Gehe & Co. believe that the difficulty of selecting the most suitable test for sulphate of quinine can be overcome by dropping the sulphate and selecting the hydrochloride as the chief officinal salt. This contains a larger percentage of quinine, and would, of course, cost somewhat more from this fact alone. But this salt may easily be prepared without being contaminated with cinchonidine, while the preparation of a sulphate entirely free from cinchonidine or containing only a definite low percentage of this alkaloid, is a difficult and somewhat expensive operation.

Rhubarb of fine quality remains as scarce as ever. Of the best quality, Shensi, only about 400 piculs are reported as representing the harvest of 1887, against 2,000 piculs in good years. Shanghai received, in 1887, only 4,248 piculs altogether, against 6,324 piculs in 1886 and 7,287 in 1885. In London there are now only 900 chests, against 1,800 at the same time last year. Even the inferior sorts have recently brought higher prices.

Sodium Silico-fluoride.—This compound, which was patented in England under the name *Salufer* ("health-bringer"), is occasionally asked for in Germany. It is said to be an efficient antiseptic, and, as it is not irritating, to be a good substitute for corrosive sublimate.

Sodium Sulphibenzoate.—This compound is obtained by saturating a concentrated solution of sulphite of sodium with benzoic acid, and may be regarded as a double salt, consisting of bisulphite and benzoate of sodium.

It is used in ½ per cent aqueous solution as a substitute for corrosive sublimate and iodoform.

Sulphurous Acid.—Besides the commercial 10-per-cent aqueous solution of sulphurous acid, of spec. grav. 1.024, the pure acid, compressed to a liquid, has recently been introduced into chemical industry for the preparation of sulphites in the manufacture of cellulose, and for preparing glue (being employed in place of hydrochloric acid). The liquefied acid is prepared in Westphalian and Silesian factories on a large scale.

Thioresorcin.—Under this name, a sulphur substitution product of resorcin will probably soon be introduced into the materia medica. It is at present being tested regarding its availability as a substitute for iodoform. It is in form of a yellowish, inodorous powder insoluble in water, difficultly soluble in alcohol, but easily in dilute alkalies.

Quinidine Sulphate.—Sulphate of quinidine, at one time almost a drug in the market, at other times in considerable demand, and justly esteemed as being practically equivalent to quinine in therapeutic value, is becoming more and more scarce, because manufacturers of quinine at the present time use Javanese or East Indian barks almost exclusively, and these contain either no quinidine at all, or so little of it, that its separation does not pay.

Bismuth with Mucilage.

JOS. F. BURNETT takes exception to advice recently given by a recent writer in the *Pharmaceutical Journal* that when bismuth is prescribed, a mixture of mucilage must be added to suspend it. He says: A mixture containing bismuth and tragacanth was made, in some quantity, by myself last summer, and however carefully made, or however elegant its appearance when made, in the course of a few days the bismuth had set at the bottom of the bottle, and no amount of shaking would again diffuse it. In fact, one might as well turn a few feet of cord into a bottle full of water and attempt to diffuse that. When tried with mucilage of acacia, the result was not one bit more satisfactory. I would, therefore, maintain that a bismuth mixture is much the better, in the long run, without gum at all, and no medical man who foresaw such a result as I have laid before you would be likely to order it. Is, then, the dispenser justified in spoiling a mixture which has to be kept a week simply for the sake of the appearance it may bear the first day? If a suspender be desired, I can give glycerin my unqualified approval, for I have used and am using any amount for this purpose, and I always find it all that can be desired. Of course, I do not suggest the addition of glycerin where the practitioner has not prescribed it, for I would dispense his mixture as written.

Crystallized Mercury Salts.

W. SIEVERS has studied methods for preparing both mercuric and mercurous preparations in a *crystalline* state, not by sublimation, but in solution. A few notes, of practical use, are here given from the author's paper (in *Ber. d. Deutsch. Chem. Ges.*, 1888, 648).

1. *Mercuric Bromide.*—This is produced by adding an excess of bromine to a solution of mercuric nitrate of the spec. grav. 1.197, rendered slightly acid by nitric acid. After a short time crystalline laminæ separate. It is necessary that the solution have the exact spec. grav. above mentioned. The crystals may be redissolved in a solution of mercuric nitrate (sp. gr. 1.197), when the salt will separate in form of white laminæ of a tetragonal appearance. From alcohol and water, the salt crystallizes in needles.

2. *Mercuric Chloride* (*Corrosive Sublimate*) was prepared by passing a current of chlorine gas through a solution of mercuric nitrate of the spec. gr. 1.197, when the salt separated in fine needles. These may be purified by recrystallization from hot water, or from alcohol.

3. *Mercurous Chloride* (*Calomel*).—A concentrated solution of mercurous nitrate was prepared by mixing 1 vol. of strong nitric acid and 4 vol. of water, and keeping this in contact with mercury for some time. Chlorine was then passed through it to saturation. This caused the separation of a crystalline and an amorphous precipitate The former was removed by washing with hot water, and the amorphous precipitate dissolved in another portion of the mercurous nitrate solution by protracted boiling. On cooling, it crystallized in small laminæ, which were washed, first with very dilute nitric acid, then with pure water. They were pure mercurous chloride or calomel. They had a yellowish-white color. Light gradually turns them gray, owing to the formation of mercuric chloride and metallic mercury.—After *Berich. d. D. Ch. Ges.*, 1888, 647.

The Percentage of Morphine in Poppy Heads and Seeds.

E. DIETERICH, of Helfenberg, has examined the flower of the red poppy (*Papaver Rhœas*) and the capsules and seed of the common poppy, to ascertain the quantity of morphine which they contain. For this purpose, he prepared extracts from these several organs, either with water or diluted alcohol, the menstruum having considerable influence upon the amount of extracted alkaloid, as will be seen further on.

Of each of the extracts thus prepared, 5 Gm. were dissolved in 30 Gm. of water, the solution filtered and mixed with 3 C.c. of normal ammonia. In all cases, not even a trace of narcotin was separated, and the solutions were simply set aside after the addition of 10 Gm. of acetic ether. After forty-eight hours, the separated morphine was collected on a filter, and the remainder of the morphine, remaining in the filtrate, was recovered by shaking the liquids with chloroform.

The total quantity of morphine thus collected was as follows:

	Morphine %.
1. Red poppy (fine) extracted with water,	0.7.
2. Red poppy (inferior) extracted with diluted alcohol,	0.14.
3. Poppy heads (fine) extracted with water,	0.032.
4. Poppy heads (inferior) extracted with diluted alcohol,	0.16.
5. Poppy heads, unripe, dried, extracted with diluted alcohol,	0.086.
6. Poppy seed, white, extracted with diluted alcohol,	0.005.
7. Poppy seed, bluish, extracted with diluted alcohol,	—

—After *Rundschau* (Prag), 1888, No. 16.

The Applicability of various Indicators for Acids and Alkalies.

THE following scheme, taken from an article on "Indicators" in the *Rundschau* (Prag), presents the chief distinctions of the different substances used as indicators in a very perspicuous manner:

The nature and use of these indicators is so well known that merely a few notes will be sufficient here.

1. *Solution of Litmus.* As is well known, commercial litmus contains, besides the pure blue coloring matter known as azolitmin, another of a dingy-violet color which may be left in the aqueous extract when litmus *paper* is to be prepared, but which is best removed when a *solution* of litmus is wanted. For this purpose, the crude litmus is treated with successive portions of boiling alcohol until this ceases to take up any more color. The remaining mass is then extracted with water, gently heated, neutralized with dilute sulphuric acid to expel all carbonic acid, and then brought back to a violet (not blue) tint by a drop or so of solution of baryta.

Solution of litmus must not be kept in tightly stoppered bottles, as this would soon render it colorless by decomposition of the coloring matter. It requires contact with the air, but this should be done so as to prevent the access of dust, bacteria, etc., as much as possible.

4. *Tincture of Cochineal*, as an indicator, is prepared by macerating 45 grains of powdered cochineal with a mixture of 1 fluidounce of alcohol and 3 fluidounces of water.

Black Leather Varnish.

Shellac	150 parts
Venice Turpentine	15 "
Yellow Wax	15 "
Nigrosin, *alcohol*-soluble	40 "
Alcohol...enough to make	1,000 "

Melt the Venice turpentine and yellow wax at a gentle heat, and gradually add the shellac previously dissolved in 800 parts of alcohol. Next add the nigrosin, in very fine powder, and lastly enough alcohol to make 1,000 parts.

In place of the nigrosin, 50 parts of lampblack may be used. This should first be triturated with a small portion of the alcoholic solution so as to get a perfectly smooth mixture.

The leather which is to be varnished or blackened should first be cleaned with a warm solution of green soap in water, or with a mixture of 3 parts of alcohol and 1 part of water of ammonia, then allowed to dry completely, and the black varnish then applied with a soft brush. After it is dry, it is rubbed over with a dry brush.

- **Applicable in all cases.**
  - In presence of carbonates, and heat. → Solution of Litmus.
  - In presence of caustic alkalies, hot or cold. → Solution of Litmus.
- **Applicable only under given conditions.**
  - Only in cold liquids.
    - In absence of citric, acetic, and tartaric acids, and of nitrites. → Methylorange.
  - In cold or in hot liquids.
    - Only when ammonia is absent.
      - ..... → Phenolphtalein.
      - Only when organic acids are absent. → Rosolic Acid.
    - Only in absence of acetic acid and metallic salts. → Tincture of Cochineal.

[We have found that a litmus solution prepared with the addition of about 4 ounces of pure chloride of sodium in the pint will keep for a long time. The chloride of sodium does not interfere with its use, and should a pure litmus solution be at any time required for a special case, it can be easily prepared. The best way to keep the solution is to put it into a bottle having a tubulure at the bottom, into which a cork, with tube and pinchcock, is inserted, through which any desired quantity may be withdrawn when needed. The neck of the bottle is to be stopped with a wad of purified cotton. In place of the tubulure at the bottom, a siphon tube may be introduced through the neck and fastened in a fixed position.—ED. AM. DR.]

2. *Methylorange.*—This is also known as Poirrier's Orange III., and is, chemically speaking, dimethyl-anilinediazobenzolsulphonic acid. This is especially valuable, as it is indifferent against carbonic acid, even in the cold. With the least trace of acid (except citric, acetic, and tartaric, in which its action is uncertain) it assumes a reddish tint, which is rendered yellow by alkalies. It must be used in high dilution (about 4 drops of a 1 in 1,000 solution) to render the change of tint quite decisive. Sometimes it is well to use litmus paper in connection with it, so as to obtain a preliminary clue as to the probable moment when the change of color is to be expected.

[In this case particularly, but also when using other indicators, much uncertainty may be avoided by placing in front of the vessels containing the liquid to be tested *two* similar vessels (beakers, etc.) containing either another portion of the same liquid (if this can be spared), or else pure water, to each of which the same quantity of the indicator has been added as to the test-portion itself. One of the two auxiliary portions is then treated with an alkali until the color has just passed into yellow. In the case of other indicators, the corresponding operation will, of course, produce another tint. Having before one's eyes two liquids, one of which represents the exact tint of the test-liquid before the addition of the reagent, while the other shows the tint at which it is desired to arrive, a much more delicate titration becomes possible, and it is not generally necessary to repeat the experiment more than once.—ED. AM. DR.]

3. *Rosolic Acid.*—This substance is soluble in ether, acetic acid, cold alcohol (much more in boiling), benzol, and disulphide of carbon. It is almost insoluble in water. Its solutions have a yellowish-red color, which changes to red with fixed alkalies. It is useful as an indicator under the conditions given in the scheme.

The Injurious Effect of Certain Gases and Vapors.

EXPERIMENTS made on this subject by Prof. Pettenkofer and K. B. Lehmann, with the following substances go to show that the general information contained in the text-books needs considerable correction.

Hydrochloric Acid Gas.—Animals exposed to air containing 3.4 per cent of the gas for 1½ hours were seriously affected; rats withstand the gas best; cats and rabbits died on the following day from the above dose. A strong man can only stand 0.05 per cent of the gas for a short time, and the limit for workmen who have become used to it is put at 0.1 per cent.

Ammonia resembles hydrochloric acid gas in its action, but it is not so injurious. 0.3 per cent in air is dangerous, and 0.5 per cent to those accustomed to it.

Chlorine.—0.001 per cent to 0.005 per cent affects the respiratory organs; 0.04 per cent to 0.06 per cent produces dangerous symptoms, and 0.6 per cent soon proves fatal.

Bromine acts like chlorine. Men cannot stand more than 0.002 per cent to 0.004 per cent if not habituated; if habituated, not more than 0.01 per cent. This shows that fumigation with chlorine or bromine in the case of cholera epidemics is of no value, since to produce fatal effects on bacteria they must be exposed to air containing 3 per cent of chlorine for three hours, or if it contains 0.4 per cent for 24 hours.

Sulphuretted Hydrogen is less poisonous than chlorine or bromine, doses of 0.7 per cent in air being needed to kill animals exposed to it for 5 hours.

Carbon bisulphide was found to vary greatly in its action in different samples, although quite free from sulphuretted hydrogen, the chief poisonous action appearing to be due to unknown impurities it contained. A cat placed in air containing 2.3 Mgr. of carbon bisulphide to the liter for 7 hours expired 10 hours afterwards.

Aniline.—0.1 per cent in air proves dangerous, cats being especially sensitive, while rabbits and guinea-pigs are comparatively less affected.

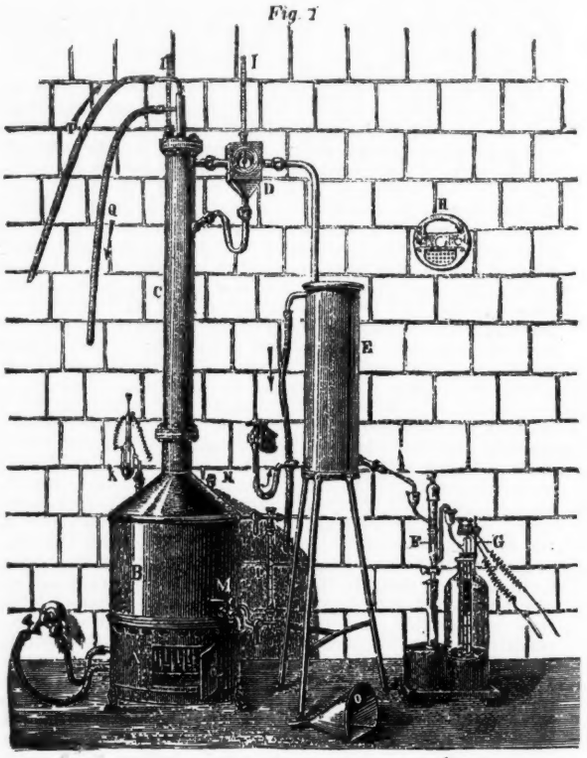
Nitrobenzene vapor, even in large quantities, produces no serious effect.

The authors consider that these gases and vapors do not only produce local effects and changes on the body or on the blood, but that the central organs of the nervous system are acted upon, also that the more highly developed the organism is, the greater is its sensibility.—*Journ. Soc. Chem. Ind.*

APPARATUS FOR FRACTIONAL DISTILLATION.

THE following form of apparatus, made from refined copper, is proposed by G. E. Clandon and E. C. Morin for the distillation of large quantities of liquid in a short time. It consists of (Fig. 1) an oven *A*, a boiler *B*, a column *C*, an apparatus *D* for separating foam, a cooler *E*, besides subsidiary apparatus, such as a manometer *K*, and test-vessel *F*. The oven *A* has two series of ring burners, each of which can be regulated at will; the boiler is provided with a cock *M*, a gauge *L*, a charging pipe *n*, and a cork for the manometer *K*, the boiler is slightly inclined towards the cock. The column *C* consists of an external sheath consisting of ten plates as shown at *H;* in the axis is a tube, the water flowing through which may be regulated; at upper end of the column is a thermometer.

Fig. 1



Clandon and Morin's fractional still.

The signal manometer *K* (Fig. 2) consists of a pin ending in a piece of platinum wire passing through the copper piece *b;* this is fastened by means of *d; c* is in contact with *b*, while *f* is insulated from *b*, and is in contact, by means of *g*, with the platinum wire dipping into the mercury. When the gas flame and flow of water are properly regulated, *c* is so placed that the end of the point of the platinum wire is a few millimeters above the level of the mercury, so that an increase of temperature and of vapor pressure can at once be signalled. The test-vessel *F* (Fig. 3) serves to determine the specific gravity of the distillate and to change the receivers, the apparatus (Fig. 4) serving to signal when the receiver is full, consists of a glass tube *a* opened at the lower end and at the side. In *a* is a small float *c*. A plate of wood or ebonite, fastened by two bolts, bears a copper rod *f*, on to which a second piece *g* is fastened by means of the screw *h*. If the receiving flask is full, the float comes in contact with the small platinum plates *l* and *m* whereby the circuit is closed and the electric bell rung.

It is necessary, for the apparatus to work well, that the distillation should be commenced slowly, and the gas flame gradually raised. A mixture of alcohol and water can be distilled at the rate of 4–5 liters per hour, while a mixture of butyl and amyl alcohols can be distilled at double the rate. The apparatus also serves for the distillation of crude petroleum, benzin, and aniline. Its efficacy is equal to that of the Le Bel Henninger column with fifteen bulbs; it is constructed by Wiesnegg, of Paris.

Hydrofluoric Acid as a Destructive Agent for the Tubercle Bacillus.

DR. E. L. TRUDEAU, of Saranac Lake, N. Y., has made a series of culture experiments with the aid of rabbits to test the value of hydrofluoric acid in tubercle—as suggested by Bastien, Charcot, Bouchard, Seiler, Chevy and more recently by Garcin. The result of his experiments "warrants the assumption" that hydrofluoric acid, even when quite freely diluted with both water and air, is capable of destroying the tubercle bacillus." He has not reached any definite conclusion as to the availability of the remedy or its efficacy as a therapeutic agent.—*Med. News*, May 5th.

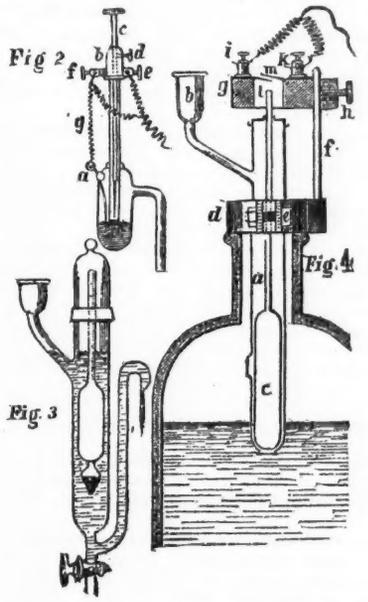
Ghatti—a Substitute for Gum Arabic.

AT a meeting of the School of Pharmacy Students' Association, April 5th, A. Mander read a paper on a variety of East Indian gums which had been mentioned as possible substitutes for gum arabic, in the course of which a description was given of *Ghatti* gum and its behavior under several pharmaceutical conditions. The gum is pale and consists of rounded or vermiform pieces of varying sizes, clear internally, but dull and roughened on the surface, apparently caused by shrinkage in drying; from brownish-yellow to perfectly colorless and transparent. More carelessly picked specimens have woody and other foreign matter adhering.

With the same proportion of water as the other gums it formed a pale yellowish-brown semi-solid mass, very powerfully adhesive.

When diluted, the solution gave a translucent, slightly gelatinous precipitate with basic lead acetate, was precipitated by alcohol, gelatinized by borax, but only a slight opalescence was produced with ammonium oxalate. By incineration, the gum yielded 2.55 per cent of an ash, consisting chiefly of potassium and calcium carbonates and traces of sulphate.

Fig 2



A mucilage was made with 1 oz. of the gum to 3 fl. oz. of distilled water.

On straining, a few grains were separated which had swollen to a translucent jelly, and these remained undissolved when treated with more water. The mucilage thus obtained is scarcely as bright as that from picked gum arabic, but quite equal to that given by ordinary good samples as to color, and at the same time more viscid. It is tasteless, inodorous, and of superior adhesive properties to mucil. acaciæ.

The emulsifying power was tried with olive oil, this being selected in preference to almond or castor oils as a more crucial test. The experiments showed that the emulsions afforded by ghatti mucilage are, as regards consistence, etc., quite equal to those by acacia, but preferable as to color, being of almost pure snowy whiteness. On microscopical examination, the oil particles in the emulsion made with ghatti and 2 parts of oil appear as nearly as possible identical in size with those given by acacia and 1 part, or half the quantity, of oil.

After standing fifteen days, the "ghatti" emulsions showed no separation of oil, and since the mucilage was made with double the proportion of water used for acacia, it must be acknowledged that the emulsive power of the gum is very remarkable.

The prevention, or long delaying, of the chemical reaction between mercuric chloride and calcium hydrate in the presence of acacia mucilage is well known, and experiments were made to ascertain if ghatti also possessed this power. That it does so in a very striking degree is evident. It is evident that ghatti gum is an article commercially obtainable at a low price and which, though differing considerably in appearance from the Acaciæ Gummi of the Pharmacopœia, possesses in a marked degree many characteristics which have been supposed to be peculiar to the latter. If more care were taken in the gathering and selection, there seems to be little doubt that picked qualities would speedily rise to considerable commercial value and pharmaceutical interest.

So far as I am aware, nothing has been published about ghatti gum, but it is scarcely probable that its peculiar properties have escaped notice by those who use large quantities of gum for confectionery or other purposes

where a good article is essential. Of course, such delightful compounds as "chewing-gum," etc., of presumably Yankee origin, and containing in some instances 7 per cent solid paraffin, are beneath notice; but the transparency of an aqueous solution which could be improved by suitable treatment, together with the light color, freedom from taste and low price of ghatti, suggests its use in better articles where gum arabic is stated to be a chief ingredient. We may venture to note in passing that it is rather strange that one special kind of pastilles should not have advanced in price proportionately to the scarcity of the African gum, and the statement that they are sold at a loss appears at least contrary to usual commercial principles. For the ordinary opaque medicated lozenges ghatti seems well suited, and as large quantities have evidently been used somewhere, it would be interesting to trace their destination: perhaps lozenge makers could supply a clue.

Most of us are familiar with the vexing fact of labels apparently well gummed refusing to stick when damped, or certain envelopes have supplied similar instances. One well-known firm sustains a reputation for avoiding this inconvenience, by using a secret composition, into which ghatti may or may not enter, but the advantages which this gum offers, either alone or in combination, for preparing adhesive substances are not small.

The prices brought by ghatti gum in the English market are as follows, showing a slight increase:—Qualities described as "good" brought, Aug. 20th, 1887, 63*s.*; Nov. 15th, 1887, 70*s.*; Feb. 28th, 1888, 75*s.*; Mar. 3d, 79*s.*; Mar. 17th, 90*s.* Qualities marked "fine" and "very fine" have brought 93*s.* and £5 15*s.*

The botanical sources cannot be definitely stated, and they are not easily ascertained. Their names afford little, if any, clue if correct, but are unreliable, as often transposed in re-packing, so comparison must be made with authentic specimens before we can decide, though the following notes may be of interest:—

By some authors it is stated that all Indian gum in the London market is the produce of East Africa, being brought in Arab vessels to Bombay, and thence exported to England. This, though probably true some years ago, cannot be so now, since very little, if any, is sent from that part of the African coast, so we must look to the gum-yielding trees of India itself.—*Pharmaceutical Journal*, April 14th.

Detection of Adulteration in Lard.

Mr. Shippen Wallace has studied this subject on behalf of the New Jersey State Dairy Commissioner, and we take the following from his paper published in the official report: *

Hübl has published a method which enables us now to determine, with comparative certainty, the kind of fat under examination, and, in certain instances, whether it is pure or adulterated (*Dingler's Pol. Journ.*, 253-281). This method is based on the fact that nearly all fats are composed of the glycerin ethers of the members of three groups of fatty acids: the acetic, acrylic, and tetrolic series. The relative proportion of these acids, in any variety of fat or oil, is constant, within certain limits, and differs only in different kinds of oil, but the members of the three groups of acids exhibit a very different behavior towards chlorine, bromine, or iodine. While, under ordinary circumstances, the acids of the acetic series are indifferent, those of the acrylic and tetrolic series readily unite with different quantities of the halogens. If, therefore, it is possible to make a fat unite with a halogen, so that the amount of the latter which enters into the compound may be accurately determined, the number thus obtained would be a constant, and would be dependent upon the amount of unsaturated acids in the fat. While the application of this principle to the determination of fats was not original with Hübl, yet he was the first to make use of iodine, and to elaborate a practical method. His method is as follows: 25 grammes of iodine are dissolved in 500 C.c. of 95-per-cent alcohol and 30 grammes of mercuric chloride in the same amount of alcohol. These two solutions are then mixed together and allowed to stand for twelve hours before using. The strength of the solution is then determined by means of a standard solution of sodium hyposulphite, whose strength has previously been determined in the usual manner. From 0.2 to 1.0 gramme of the oil or fat is then weighed off and dissolved in 10 C.c. chloroform, and 25-30 C.c. of the iodine solution added, and, after standing in a closed flask for not less than three hours, the amount of unabsorbed iodine is determined by means of the hyposulphite solution. By a simple calculation, the number of grammes of iodine taken up by 100 grammes of the oil or fat is then found, and this number is the "constant" for the fat examined. Hübl examined a large number of fats and determined their iodine absorption percentage, and a number of others have verified the reliability of his process. He gives

for lard	59 per cent.
" tallow	40 " "
" cotton-seed oil	106 " "

Mr. Wallace examined some thirty samples of lard of known purity, and obtained 59.2 as the average iodine number, the maximum being 62.2, and the minimum 57.4 per cent. Cotton-seed oil having such a high iodine degree, its presence would be indicated, when mixed with lard, by a higher figure than that for pure lead; and if with tallow, by a lower figure. The amount of admixture can be approximately estimated by means of the following formula:

$$x = \frac{100\,(I-n)}{m-n}$$

where x is the percentage of one fat (which being known, at once gives the percentage of the other fat y). I is the iodine degree or iodine number of the mixture; m is the iodine degree of the fat x, and n that of the fat y.

As it is, however, quite easy to blend together tallow and cotton-seed oil in such proportions as to produce a mixture having the same iodine number as pure lard, some additional methods must be resorted to when a sample of lard appears to comply with Hübl's test and yet is suspected of being adulterated.

One of the most reliable tests now available is that of Becchi, which has been several times slightly improved and is now performed in the following manner: A solution is prepared composed of 85 parts of amylic alcohol and 15 parts of rape-seed oil. Another solution containing 1 Gm. of nitrate of silver in 200 C.c. of 95-per-cent alcohol is also prepared. Now take 10 C.c. of the melted lard to be examined, and 1 C.c. of the alcoholic solution of silver nitrate, and then from 8 to 10 C.c. of the mixture of rape-seed oil and amylic alcohol. Shake the mixture thoroughly, and then heat it in a water-bath for five minutes. If the lard contains no cotton-seed oil, the color of the mixture remains the same as before heating, the mixture of lard and rape-seed oil producing a pale straw color. If cotton-seed oil is present, there will be produced a brownish color of a varying shade, from a light to a deep dark, according to the quantity of cotton-seed oil present. In performing the test, the following precautions must be observed: In heating the mixture, the tube containing the same is placed in the water-bath and subjected to, at the most, five minutes' heating in the boiling water; longer than this will often produce a slight discoloration, which may be misleading, although after practice one will not mistake the color. It is also well, at the time the suspected lard is thus examined, to conduct at the same time and to submit to the same length of heating an examination of a sample of pure lard; by this means, if the time is exceeded, and a discoloration is produced, it can readily be seen whether it has been caused by the cotton-seed oil or overheating. In all the tests I have thus made, I have found the mixture to begin to color in about three minutes, and, at the end of five minutes, the darkening has been perfectly evident, while during the same time the pure lard has not been changed, or at the most, has become what one might term one shade darker. The cause of the mixture becoming darkened is owing to the decomposition of the silver nitrate. Owing to the difficulty in obtaining rape-seed oil, what I have used I extracted and purified myself. In all samples of suspected lard, if one will follow the methods here given, he cannot fail to meet with correct and proper results:

I. Hübl's method, which will indicate either adulteration with tallow alone or cotton-seed oil alone, or indicate pure lard.

II. Use Bechi's test, as described, which will prove the presence or absence of cotton-seed oil.

III. Use the sulphuric acid test as a further confirmation [See Oleum Gossypii, U. S. Pharm.]. By these last two, if Hübl's method should yield a figure which should classify the suspected lard as pure, one can readily confirm or disprove it, while if Hübl's should indicate cotton-seed oil, they would make the proof complete. Lard stearine yields figures, by Hübl's method, within the range of pure lard, and while some manufacturers make use of this article in the manufacture of summer lard, yet it is not an adulteration in the same sense that cotton-seed oil and tallow are. I have not mentioned other claimed adulterants of lard, as they are easy of detection; water we sometimes find, one sample I examined containing 11.80 per cent. When this is found, it is either caused by carelessness in the manufacture, or is intentional, as it can readily be guarded against.

Rapid Preparation of Tincture of Iodine.—C. Dandt recommends to dissolve 1 part of iodine in 9.2 parts of *absolute* alcohol, and then to add 0.8 parts of water. Iodine dissolves very quickly in absolute alcohol, but comparatively slowly in common alcohol.—*Pharm. Zeit.*

The U. S. Ph. directs the tincture to contain only 8 parts of iodine, instead of 10. If it is to be made quickly Dandt's plan may be followed. In this case, the following proportions are to be used:

Iodine	8 parts.
Absolute Alcohol	86 "
Water	6 "

* Report of the Dairy Commissioner of the State of New Jersey, 1887. 8vo., Trenton, 1888.

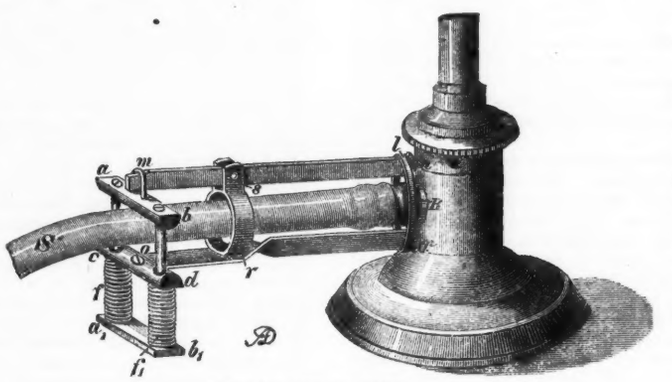
SAFETY STOP-COCK FOR GAS BURNERS.

ACCIDENTS happen not unfrequently through the flame of a gas-burner or gas-stove striking back to the orifice where the undiluted gas issues, and by overheating the rubber-tubing sets fire to the latter and to surrounding fixtures. [Two serious conflagrations, caused by an accident of this kind, are known to the editors of this journal.] Various plans have been heretofore proposed to prevent damage from this cause. But, while all these plans provide for the extinction of the burning gas or flame, none of them insures the interruption or stoppage of the current of gas. Klobukow has recently described a device which appears to accomplish the object by causing the gas delivery tube to be compressed by springs set into action after the fusion of a composite ring holding them apart.

The apparatus is a peculiarly constructed stop-cock with strong springs *f* and *f*, which is applied to the gas-burner in the manner shown in the cut.

The rubber-tubing attached to the burner passes through a ring *v*, and between two parallel bars *ab*, *cd*, which are kept apart by the levers *mn*, *op*, the ends of which are held in place by a ring *l*, made of low-fusing metal. As long as this ring holds the ends of the levers, gas will pass through the tube. As soon as the ring *l* is taken off or broken the springs at *f* will come into action and cause the two parallel bars *ab*, *cd*, to be pressed together, thereby shutting off the supply of gas.

The ring *l*, upon which the action depends, and which is situated where the effect of heat (caused by the striking back of the flame is first noticed), is made of a composition suitable to correspond to the temperature which is not to be exceeded. The best material to make the rings of is the fusible metal of Wood or Lipowitz, which melts at a temperature of 74° C. (165.2° F.) and 71.5° C. (161° F.)—After *Zeitsch. f. Anal. Chem.*, 1888, 168.



Safety stop-cock for gas burners.

Hydrofluosilicate of Quinine.

THE preparation of the acid and neutral hydrofluosilicates of quinine is reported by Dr. Cavazzi (*Archiv*, March, p. 228), who believes that these salts will prove useful as possessing at the same time antipyretic and antiseptic properties. The salts are described as being formed upon treating with silicon fluoride a solution of anhydrous quinine (*sic*, but query quinine hydrate?) in carbon bisulphide or absolute alcohol. From an alcoholic solution the neutral salt separates first in white flocks, consisting of microscopic crystals which are completely insoluble in carbon bisulphide and ether, and only very slightly soluble in alcohol, but very freely soluble in water. Upon passing in more silicon fluoride, the acid salt is formed, the crystals dissolving to give a fluorescent liquid. The two salts may also be formed by bringing together quinine hydrate and hydrofluosilicic acid in aqueous solution in molecular proportions and evaporating.—*Pharm. Journ.*

Caffeine from Tea.

AT a recent meeting of the London Chamber of Commerce (reported in *Chem. and Drugg.*), the question of the manufacture of caffeine came up for discussion, with a view to have some changes made in the British custom laws to permit the importation, duty free, of damaged tea or tea sweepings. Of course it is well known that manufacturers of caffeine generally have recourse to *tea*, as the source of the alkaloid, and for their purposes it is immaterial whether the tea is damaged or not, as long as it contains a sufficient amount of caffeine. According to Mr. Thomas Christy's statement, made at the meeting before mentioned, there are between 3,000 and 4,000 pounds of caffeine annually made in Germany from tea sweepings which were refused admittance into England. He advocated an alteration in the regulations, so that the home industry might be benefited thereby. He suggested that the sweepings or any damaged or inferior tea, which it was intended to admit for such purposes, should be treated with enough petroleum to render it unfit for consumption. This treatment would not at all interfere with the manufacturers' process for extracting the caffeine.

The British customs officials, who are known to be crusty, unwilling to go out of old well-trodden tracks, and afraid of doing anything for which there is no "precedent," do not seem to take very kindly to this proposal, though they thought that "the request might be brought before the authorities."

Testing for Arsenic in Metallic Iron.

J. G. BERGMAN, of Gothenburg, points out (in *Pharm. Centralhalle*, No. 8) that the presence of arsenic in powdered iron (Ferrum pulveratum) cannot be detected either by the process prescribed by the German Pharmacopœia, or that of the German Pharmacopœia Committee, because *arsenide of iron* is insoluble in diluted hydrochloric acid.

Woehler demonstrated, as far back as in 1840, that when arsenical iron was dissolved in dilute sulphuric acid no arsenetted hydrogen (AsH_3) was evolved. Eggeriz showed, in 1870, that on dissolving iron in arsenical sulphuric acid, no arsenetted hydrogen is given off after the escape of pure hydrogen. Ahlberg, in 1885, demonstrated that the facts thus ascertained when sulphuric acid was present, were valid also in presence of hydrochloric acid.

Hence, in examining powdered iron [or any kind of metallic or reduced iron, suspected to contain arsenic—ED. AM. DR.], the arsenic will be found in the residue left behind undissolved by the acid. In this it may be detected either by Bennendorff's method—dissolving the residue with concentrated hydrochloric acid and the smallest possible quantity of potassium chlorate, or by distilling with ferric chloride, ferrous sulphate, and hydrochloric acid of spec. gr. 1.190 (Schneider's process), in the usual manner.

Strophanthus.—Frænkel reports in the *Deutsche med. Wochenschrift* the results of a series of trials of strophanthus, and says that as a heart tonic it is efficient, but can in no sense approach the digitalis excepting in individual cases where, owing to some peculiar condition, it acts more favorably. It acts best in functional disorders such as are caused by alcohol or tobacco, and also in the relief of ascites caused by engorgement of the portal circulation.

The Reaction between Zinc and Sulphuric Acid.

IT is usually supposed that the reaction between zinc and sulphuric acid in the presence of water always takes place after the following scheme:

Zn	+	H_2SO_4	=	$ZnSO_4$	+	H_2
zinc		sulphuric acid		sulphate of zinc		hydrogen

Pattison Muir and R. H. Adie, however, have made this reaction the subject of a detailed investigation, and have come to very important results. It has, indeed, been known before that sometimes other gases, such as hydrosulphuric and sulphurous acid were formed during the reaction, but the conditions for their production were not known.

Muir and Adie find that the purer the employed metallic zinc is, the smaller are the quantities of secondary products (hydrosulphuric and sulphurous acid) produced, no matter whether a concentrated or a dilute sulphuric acid is used. When 1 molecule of this acid is diluted with 10 to 12 molecules of water, *hydrogen* is almost the sole product of the reaction, even on boiling. If the zinc used is almost chemically pure, and the reaction takes place at a temperature of 160° C., dilution of the acid diminishes both the quantity of generated hydrosulphuric acid, as that of sulphurous acid. If commercial zinc is used, the proportion of the last-named acid is diminished. With *commercial* zinc, even so dilute an acid as one composed of 1 mol. of H_2SO_4 and 100 mol. of water, still produces some hydrosulphuric acid at temperatures between 0° C. and the boiling point.

Platinized zinc behaves like the commercial substance. An acid of the concentration 1 mol. H_2SO_4 and 2 mol. water generates with commercial zinc, at 100° C., scarcely traces of either hydrosulphuric or sulphurous acids. At 165° C., however, it produces copious quantities of the former with traces of the latter. At 180° C., hydrosulphuric acid gas is given off in streams, almost free from sulphurous. Under the same circumstances, an almost pure zinc generates both gases in large quantities. Free sulphur is separated in notable quantities only when platinized zinc is used. At low temperatures, however, or with acids containing less than 2 mol. of water, free sulphur was never met with, even when hydrosulphuric or sulphurous acid was given off.—After *Journ. Chem. Soc.*, 1888, 47.

Adhatoda Vasica.

DAVID HOOPER describes in the *Pharmaceutical Journal* of April 7th a shrub growing in India (where it is very common) which has some remarkable properties. As a medicine, the leaves of the *vasaka*, as it is called in the vernacular, have been long in use as an expectorant and antispasmodic in conjunction with an aromatic. It is also used as an ingredient in popular anthelmintics. In Bengal, the leaves have been smoked for the relief of asthma. In the arts, the yellow coloring-matter extracted by water is used in connection with indigo to produce a green dye. It is in agriculture that the leaves are of unique value. Dr. G. Watt says that in the Sutley valley the fresh leaves are scattered over recently flooded fields prepared for the rice crop, and the native cultivators say that the leaves not only act as a manure, but also as a poison to the aquatic weeds that otherwise would greatly injure the rice. Fields not treated in this way are covered with a green scum, but after the leaves are added they are supposed to kill the floating duck-weed and the submerged *chareæ*, and prevent their propagation.

The author of the paper reports the following experiments: A sample of pond water containing *Spirogyra* and numerous animalcules was mixed with a few drops of a strong infusion of adhatoda leaves. The chlorophyll gradually disappeared from the weeds and the cells became broken up. Oxygen was given off with less frequency, and at length ceased. Some insect pupæ rose to the surface and then died. Numerous *Paramecia* remained active for some time, but eventually succumbed to the action of the poison. In twenty-four hours the water showed only a brown mass lying on the bottom of the glass, while a corresponding specimen, which had not been treated, contained the green aquatic weeds evolving oxygen and living animalcules.

A solution of sulphate of vasicine was added to water in a basin containing a live frog. The frog immediately sank, without the slightest movement and was unmistakably dead in a short time. Some small leeches adhering to the frog before the vasicine was dropped into the water, at once left it and came to the surface, those that did not succeed in escaping from the vessel were in an hour's time quite lifeless.

An aqueous solution of an alcoholic extract of the leaves was tried upon flies, fleas, musquitoes, centipedes and other insects, and in every case the results were poisonous. The solution appeared to kill them without previous intoxication.

On higher animals the leaves do not seem to have such an effect. A quantity of the alcoholic extract representing 225 grains of the leaves was given to a small dog and was not followed by inconvenient symptoms.

Some Practical Notes on Filtration.

FROM an article on this subject, by Mr. Eug. Dieterich, printed in the *Pharm. Centralhalle*, we take the following:

In order to obtain clear filtrates, the filter should be moistened with the same liquid which is to be passed through. In the case of tinctures, alcohol or dilute alcohol is used, as the case may be; for aqueous solutions, water, etc., etc.

In filling up the filter (which must be pushed down in the funnel to the furthest point where it will lie flat), the liquid should be poured down its side.

For liquids which pass only slowly through filters, it is not unusual to use vacuum-pumps or aspirators. The author (Mr. Dieterich) does not regard these with favor, as he finds that they soon become clogged with sediment. Besides, suction under a high vacuum usually produces a turbid filtrate. [This is probably to be understood as referring to Mr. Dieterich's experience in filtering pharmaceutical liquids on a large scale.]

When a piece of filtering paper is to be laid upon a muslin-strainer, the paper should, before being wetted, be crumbled or crushed by hand, so as to make it more readily adapt itself to the folds or curves of the muslin.

Felt or flannel filtering bags do not usually filter clear at once, but require the repeated passage of the liquid before they will do so. If no clear filtrate can be obtained in this manner, the following plan may be adopted:

Soak a sufficient quantity of filter-paper or its clippings in just enough cold water, and rub it to a pulp. Then dilute it with hot water and pour some of the mass upon the walls of the filtering-bag, which must previously have been wetted and pressed. The fabric eagerly seizes upon the water and the paper pulp remains adhering to the surface. The superfluous water is allowed to drip off, a funnel with wide tube is then inserted and the bag filled with the liquid. [Care should be taken that the latter be not allowed to fall into the bag from a great height, as this would disturb the paper. A good plan is to permit a rubber (or other) tube, connected with the reservoir containing the turbid liquid, to reach to the bottom of the filtering-bag, its orifice ending in a small capsule or cup. The flow of liquid is controlled by a stop-cock. An arrangement of this kind will effectually prevent any disturbance of the filtering surface.—ED. AM. DRUG.]

The author states that he works by the plan described by him, and that he uses a half-woollen ordinary flannel, which is regarded merely as an exterior shell, the greatest care being bestowed upon the coating of paper-pulp.

No matter whether a funnel has a large or a small funnel-tube attached to it, it is always necessary to contract the orifice where the point of the filter rests, to prevent its bursting. In funnels with wide necks, this is best done by a wad [of cotton or tow].

Funnels with ribbed walls are preferable. The walls must not be curved, but perfectly straight.

A Root Resembling Ipecacuanha.

FRANCIS RANSOM lately reported to the Pharmaceutical Society of Great Britain that a root called false Ipecacuanha had lately appeared for sale in the London market. It was dark-colored externally, not annulated, but marked longitudinally. The powdered root was of a red color; it contained much starch, but no glucose. When broken, the root was found to possess a corky portion which was distinctly porous and otherwise unlike true ipecacuanha. There was no difficulty in recognizing the root as that of *Psychotria emetica*. A similar root is sometimes referred to a *Richardsonia scabra*. Long ago Pelletier reported, as the result of an analysis, that the root contained 9 per cent of emetine; but he subsequently admitted that his alkaloid was far from being pure, so that this analysis cannot be relied upon. To test the matter further, the author extracted 20 grammes of the powdered root with ammoniated chloroform by continuous percolation. Part of the percolate was shaken with water acidulated with sulphuric acid, and this solution, separated and tested with Meyer's and other alkaloidal reagents, gave an exceedingly slight indication of the presence of alkaloid. Another portion of the ammoniated chloroform percolate was shaken with water acidulated with acetic acid, and this aqueous solution on evaporation responded feebly to the test for emetine. This indication was followed up by a quantitative test, which resulted in 0.027 per cent being found as the quantity of alkoloid in the root. It therefore appears that striated ipecacuanha is of little value, so far as chemical tests can show, and these are corroborated by physiological effects. Thus, 60 grains of the powder had no effect upon the author; a dog swallowed ½ oz. of it and showed no signs of discomfort; and Professor Cash, of Aberdeen, has experimented with it and finds it to be inert. A museum specimen of the same drug gave similar results.—*Chemist and Druggist.*

Preparation of Pills or Granules of Aconitine or Digitalin.

IN view of the extremely powerful action of crystallized aconitine or digitalin, and the risks attending any inaccuracy in dispensing them, Benoit and Champigny recommended (in the *Journ. de Pharm.*, 1888 [April], 406) to dissolve the alkaloids by a suitable solvent and to triturate the solution with milk-sugar, and a small quantity of harmless coloring matter, which will enable the eye to distinguish when the triturated powder has become perfectly uniform. For nitrate of aconitine, the authors recommend, as a solvent, boiling water [which we consider unadvisable, as it may cause decomposition—ED. AM. Dr.]. For the alkaloid aconitine and the neutral principle "digitalin" (that is, the crystallizable principle known by that name), they recommend chloroform. This solvent has special advantages. It will serve as a sort of test of identity, inasmuch as the crystallizable aconitine or digitalin are very easily soluble in it, and any impurities which they might contain would be left behind.

To guard against inaccuracies in weighing, the authors recommend to weigh out never less than 1 centigramme (say ⅙ grain), and to make a large enough batch of pills or granules of the desired strength to consume the whole amount weighed out, though several hundred may have to be made at one time. They give the following formulas:

1. *For Nitrate of Aconitine.*

	Gm.	
Nitrate of Aconitine	0.01	⅙ grain.
Sugar of Milk, powd.	4.00	60 grains.
Acacia, powd	1.00	15 "
Excipient	q. s.	

As excipient, the officinal "mellite" (or syrupus mellis) is recommended, with addition of 10 per cent of glycerin. Syrup of honey is prepared by adding to 4 parts of honey 1 part of water.

Dissolve the alkaloidal salt in 1 Gm. of boiling water, and pour the solution, drop by drop, upon 2 Gm. (30 grains) of sugar of milk, constantly triturating. Rinse the tube in which the solution had been made with a few drops of hot water, which is to be added to the mass in the mortar. Then gradually incorporate the remainder of the sugar of milk, afterwards the acacia, and lastly make a suitable mass with the aid of the excipient. Divide the mass into 100 granules (each containing $\frac{1}{600}$ grain of nitrate of aconitine) and keep them in a dry and well-stoppered bottle.

Chloroform for Preserving Dispensing Solutions.

JOS. F. BURNETT writes, in the *Pharmaceutical Journal*: Any one who has to get through a large amount of dispensing in a short time has his ingenuity put to work to devise every means he can to expedite his work. One of the first and most natural ideas is to keep every drug or chemical (which is likely to be required) in solution. I now keep large numbers of dispensing solutions, in fact many more than ever I previously did. Then crops up the difficulty that many soon spoil, ferment, develop fungoid growths, etc., etc. Where such is the case I use chloroform water, B. P., for the solvent, and in not a single instance have I found it fail to keep the solution perfectly. I may note in passing that I have the permission of the medical staff to use any such device as this, for the dose of chloroform introduced into a mixture by adding, *e. g.*, 80 minims of a 1-in-10 solution of quinine is neither here nor there. I have by me quantities of pulv. rhei rubbed down with aq. chlorof., likewise pulv. cret. aromat., solutions of quinine, fer. am. cit., pot. acet., pot. citr., and a host of others, some of which are some months old, and are as good as the day they were made. A couple of drachms of chloroform will keep for a fortnight as much as three gallons of fresh infusion of gentian. Infusion of calumba or buchu made four times the strength of the B. P. (*i.e.*, conc. 1 to 3) keep perfectly when one drachm of chloroform to the quart is dissolved in them. With infusion of buchu I consider this a distinct advance on using spirit (which the 1 to 7 preparation of the wholesale houses contains), for the chloroform does not throw down any mucilaginous constituent. These are but a few examples of the use of chloroform as a preservative.

Reaction between Chloral and Cyanide of Potassium.

ATTENTION has been called by Messrs. Blarez and Denigés (*Bull. Soc. Pharm. Bord.*, Feb., p. 46) to an interesting reaction observed in dispensing a prescription ordering chloral hydrate and potassium cyanide together in an ointment. It was found that, when equal weights of these two compounds were powdered in a mortar and mixed, after an interval varying from half a minute to three minutes, effervescence occurred in the mass, which became yellow and then brown, hydrocyanic acid being given off freely. It was also found that when the ingredients were present in other than equal proportions, the reaction took place less quickly, but that the retardation was greater when the potassium cyanide was in excess than when the chloral hydrate preponderated. The intervention of water or alcohol also retarded the reaction in proportion to the quantity added, until a certain amount of stability was attained when the relation of the liquid to the solid was 5 to 1, but even dilute solutions were decomposed when boiled. In contact with lard the decomposition commences at once, so that such an ointment would be an improper preparation. If such a combination be really desirable, it is suggested that a solution should be prepared not stronger than 1 in 10, by adding the chloral hydrate and the potassium cyanide to the water separately. In the reaction which takes place, dichloracetic acid, hydrocyanic acid, and potassium chloride are formed.—*Pharm. Journ.*

Testing Olive Oil.

AT the Station Agronomique at Nice, according to M. Brullé (*Compt. Rend.*, cvi., 1,017), a mixture of nitric acid and egg albumen is used to detect the presence in olive oil of other vegetable oils. About 0.1 gramme of albumen in powder being placed in a test tube, 2 C.c. of nitric acid is added, and then 10 C.c. of the oil to be tested, after which the mixture is heated gently over a flame in such a way that the acid and the oil shall be kept at practically the same temperature. When the nitric acid commences to boil, the test tube is inclined so that the ebullition affects the mixture of the oil and the albumen. If the sample be pure olive oil, the color of the mixture is now yellow with a greenish tint, but if it contains 5 per cent of seed oil, it takes a free amber-yellow color which is darker with a larger proportion of foreign oil, until with 50 per cent of the color is deep orange. This test has been found to hold good for mixtures of olive oil with oils of cotton-seed, earthnut, sesame, poppy-seed, colza, camelina, and linseed. One exception has been met with, under the name "*aveline exotique*," which gives a rose tint with whitish spots. Nitric acid alone gives colorations that approximate to those mentioned, but only with colored oils; it is without perceptible effect upon mixtures containing poppy-seed or earthnut oil, which are relatively colorless.

A New Form of Suppository.—A new form of suppository has been suggested by Dr. S. G. Dixon (*Therap. Gaz.*, p. 241), which differs in the broader end being terminated in a cone, so that the whole represents a double cone, of which the upper is only half as long as the lower. The upper or shorter and broader end is inserted first, and the suppository, by reason of its shape, is easily retained and forced upwards by the sphincter muscle.

Sulfonal.

THE Berlin correspondent of the *Chemist and Druggist* writes that a new soporific, called, for short, sulfonal, has been announced. It is produced by the oxidation of a mixture of ethylmercaptan and acetone, and is otherwise known as diethyl-sulphonic-dimethyl-methane, or

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix} \diagdown C \diagup \begin{matrix} SO_2C_2H_5 \\ SO_2C_2H_5 \end{matrix}$$

It is in the form of tabular crystals, without odor, taste, or color; is soluble in from 18 to 20 parts of boiling water, or 100 parts of water at ordinary temperatures. In alcohol, or alcohol and ether, it is more soluble. It is not decomposed by oxidizing agents, acids, nor alkalies. Prof. Kast administered it to 20 healthy men and showed that as much as 1 drachm can be taken without unpleasant effects; Prof. Cramer, of Marburg, gave 300 doses to 60 persons; Prof. Bäumler gave 120 doses to 30 persons in private practice, and the proper dose appears to be 15 to 30 grains, or as much, perhaps, as 45 grains for robust males. Almost always deep and tranquil sleep commences within half an hour and lasts from five to eight hours, and is not followed by the slightest after-symptoms. It was particularly useful when insomnia was caused by illness or attendant upon insanity. In administering it, a powder of 15 grains may be given in a wafer, or mixed with water.

Guarana.

DR. H. H. RUSBY, in a lecture before the Philadelphia College of Pharmacy describing his recent experiences in South America, described the cultivation and preparation of guarana, in the course of which he said: As cultivated in the region about the lower Madeira river, it is planted like a vineyard, excepting that it is planted wide apart and is poled like hops. It is kept within bounds by pruning. The opening of the seeds is shown by the opening of the pods. The first resembles a hickory-nut and is contained in a husk consisting of three instead of four parts. They are shelled out by hand, washed, and then roasted for six hours. The roasting loosens a papery shell which is detached by placing the nuts in a bag and beating them with sticks. The best variety of guarana is that in which the seeds have not been broken finely. Enough water is added to form a mass and the seeds are thus kneaded by hand to the consistency of dough. Foreign substances are not generally added, as is commonly believed. The dough is then spread on the upper floors of a large building and subjected to a uniform heat by means of fires which give off little smoke. Great experience is needed in this stage of the process. By the natives guarana is used by filing off a portion of the mass and mixing it with a glass of cold water. It contains two or three times as much caffein as coffee and its effects are very refreshing, but when used in excess causes trembling and muscular weakness.—*Amer. Journ. Pharm.*

Oil of Hyoscyamus.

A FATTY oil, containing in solution some of the chlorophyl and active principles of certain narcotic plants, is a favorite remedy in continental practice, and such as that mentioned in the title is not unfrequently prescribed here. For this reason, the National Formulary has adopted a formula for its preparation. This formula is based upon an improvement of the one previously in use (Pharm. Germ.), suggested by E. Dieterich, of Helfenberg, who recommended to digest the comminuted plant with alcohol and ammonia, so as to set free the alkaloids, and then to digest it with the oil which dissolved the active principle. Recently, Dieterich has gone a step further and recommends to extract the desirable constituents from the plant by percolating with a suitable menstruum. For this purpose, 100 parts of the finely powdered herb are moistened with a mixture of 100 parts of alcohol, 40 parts of water of ammonia, and 36 parts of ether, then packed in a percolator, allowed to macerate one hour, and then exhausted with ether. The ethereal extract is mixed with 500 parts of olive oil, and the ether then distilled off.

An oil of hyoscyamus thus obtained possesses a very fine green color, a strong, narcotic odor, and contains practically the whole amount of alkaloid contained in the herb.

Hectograph Sheets.—Soak 4 parts of best white glue in a mixture of 5 parts of water and 3 parts of solution of ammonia, until the glue is soft. Warm the mixture until the glue is dissolved, and add 3 parts of granulated sugar and 8 parts of glycerin, stirring well, and letting come to the boiling-point. While hot, paint it upon white blotting-paper with a broad copying-brush, until the paper is thoroughly soaked, and a thin coating remains on the surface. Allow it to dry for two or three days, and it is then ready for use. An aniline ink should be used for writing, and before transferring to the blotting-paper, wet the latter with a damped sponge, and allow it to stand one or two minutes. Then proceed to make copies in the ordinary way. If the sheets are laid aside for two days, the old writing sinks in and does not require to be washed off.—*Chem. and Drug.*

Photoxylin.

GEO. M. BERINGER, having attempted the manufacture of photoxylin, a substance used in Russia in place of gun-cotton, has described the method employed by him. Wood-pulp was obtained of the manufacturer both in the loose, fibrous form, and as condensed by rolling into thick and porous sheets. After careful drying, the pulp was nitrated in the following solution:

Nitrous acid, 43° Baume	3½ lb. av.
Sulphuric acid	4½ lb. av.
Potassium nitrate, granular	8 oz. av.

The acids having been mixed in an earthenware crock and allowed to cool to 90° F., the potassium nitrate was added and thoroughly incorporated. Four oz. av. of the well-dried pulp was immediately placed in the mixture and allowed to remain for 12 hours. It was then removed and thoroughly washed. The addition of a few drops of ammonia to the wash water facilitated the removal of the acid. Nitrocellulose thus prepared leaves little or no residue on burning and is entirely soluble in a mixture of 50% of concentrated ether and 50% ot alcohol. Three per cent of this photoxylin is sufficient to make a very thick collodion which leaves a very tough film when applied. An addition of 5 drops of castor oil to the fluidounce renders it flexible. This solution (also called "photoxy. lin") has the advantage over ordinary collodion of giving a stronger film.—*Amer. Journ Pharm.*

Delicate Test for Nitrous Acid.

IN the course of a paper on the estimation of nitrous acid (in *Journ. Chem. Soc.*, 1888, 364), Prof. Frankland states that when he has to test *qualitatively* for minute quantities of nitrous acid, he always relies upon Zambelli's modification of the sulphanilic acid test. This is as follows:

Add to the solution suspected to contain a nitrite, first 1 drop of a saturated aqueous solution of sulphanilic acid, then a drop of an aqueous solution of phenol, and render the mixture alkaline with ammonia. If any nitrous acid is present, the liquid will assume a color varying from faint yellow to intense reddish yellow (like the color of a strong solution of potassium bichromate), according to the quantity of the nitrous acid present. This test is capable of indicating the presence of 1 part of nitrous nitrogen in 40,000,000 parts of water. And whilst its delicacy is extreme, it has the further advantage that the reagents employed are permanent in solution.

The estimation of the amount of nitrous acid present by this method, as will be known to those of our readers who are familiar with water-analysis, is made by ascertaining, experimentally, the depth of tint corresponding to varying proportions of nitrous acid, and then using a standard scale of colors (such as a glass prism the color of which deepens towards the thick end, or a hollow prism filled with a colored liquid), each shade of which is known to correspond to a definite amount of nitrous acid.

Anthrarobin Preparations.

The new substitute for chrysarobin, proposed by Prof. Liebermann, will probably be obtainable in the market here by the time that this number is in the hands of our readers. Regarding its nature and properties, compare our April number, page 62.

Behrend has given the following combinations in the *Therap. Monatshefte:*

Anthrarobin Ointment.

1. Ten (10) per cent.

Anthrarobin	10 parts
Olive Oil	30 "
Lanolin	60 "

or:

Anthrarobin	10 parts
Olive Oil	15 "
Lard	75 "

2. Twenty (20) per cent.

Anthrarobin	20 parts
Olive Oil	40 "
Lanolin	40 "

or:

Anthrarobin	20 parts
Olive Oil	20 "
Lard	60 "

Anthrarobin Tincture.

1. Ten (10) per cent.

Anthrarobin	10 parts
Alcohol	90 "

2. Twenty (20) per cent.

Anthrarobin	20 parts
Alcohol	80 "

Anthrarobin Solution.

1. Anthrarobin ..... 10 parts
   Borax ..... 8 "
   Water ..... 80 "

or:

Anthrarobin	10 parts
Glycerin	80 "

Fly and Mosquito Bane.

A good preparation to prevent the bite of flies and gnats, and also mosquitoes, is the following, recommended by Dieterich (and Vomacka).

Expressed Oil of Bay	10 parts.
Oil of Eucalyptus	20 "
Ether	20 "
Alcohol	70 "

Dissolve the Expressed Oil of Bay (Oleum Lauri expressum) in the ether, and the Oil of Eucalyptus in the Alcohol. Mix the two solutions, and filter rapidly in a covered funnel.

This compound may be used on domestic animals as well as by man, or it may be applied to places about the house which it is desired to protect against the visitation of flies, etc.

Phosphate of Copper as a Remedy in Phthisis.

DR. LUTON believes phthisis amenable to cure or amelioration by the administration of phosphate of copper "in a nascent state," and dissolved in an alkaline menstruum. He recommends pills containing each

	Gm.	
Acetate Copper, neutral	0.01	⅙ grain
Phosphate Sodium, cryst.	0.05	¾ "
Liquorice Root	q. s.	q. s.
Glycerin	q. s.	q. s.

Also a mixture:

Acetate Copper, neutral	0 05	¾ grain
Phosphate Sodium, cryst.	0.59	10 grains
Mist. Acaciæ	1.25	4 fl. oz.

Dose: A tablespoonful.

—*L'Union Pharm.*

Antineuralgic Salve.

(Galezowski.)

Menthol	15 parts
Cocaine (alkaloid)	5 "
Chloral	3 "
Vaseline	100 "

Mix intimately. To be applied to the painful part.—*Rép. de Pharm.*

Alizarin Ink Powder.

Tannic Acid	450 parts.
Sulphate of Iron (cryst.)	350 "
Chloride of Sodium	250 "
Bisulphate of Potassium	75 "
Indigocarmine, dry	50 "
Picric Acid	4 "

Mix the sulphate of iron (reduced to a coarse powder) and chloride of sodium and dry them in an iron pan over a naked fire, constantly stirring. Lastly reduce the mass to a fine powder. Rub the bisulphate of potassium to a fine powder in a mortar, and mix this intimately with the picric acid. Then mix this mass with that first prepared and lastly incorporate the other ingredients. [Picric acid is poisonous, and under certain conditions, explosive. It should be manipulated as directed above.]

The resulting product is a green powder which, when dissolved in 15 parts of water, yields a superior ink, which turns jet-black.—*Vomacka.*

Crayons for Writing on Glass.—The following process answers well for the production of pencils that will write readily on clean dry glass.

Take of

Spermaceti	4 parts.
Tallow	3 "
Wax	2 "

Melt together in a small dish, and stir in finely powdered, and thoroughly mixed

Red lead	6 parts.
Carbonate of potassium	1 part.

Keep the mass melted and stirred for about half an hour, and then pour into suitable moulds, and cool as rapidly as possible.

If the mixture be introduced into glass tubes of convenient size, the solid cylinder can be pushed out when cooled and sharpened, the tube being used as a handle. Of course, French chalk will also answer.—*Br. and Col. Drug.*

Testing the Tightness of Tin-Cans.—Tin-cans are best tested as to their tightness by filling them with compressed air and immersing in water. Any air-bubbles ascending through the water would show the existence of a leak, which it is then easy to close by soldering. There is no risk of any water getting into the cans, during the trial.—*Drogist. Zeit.*

Dextrin as an Adulterant of Extracts.—Pannetier says that the addition of dextrin to extracts, before complete evaporation, gives them a good appearance and consistence, and that this practice has reached an alarming point in the extracts sold in France.—*Nat. Drug.*

The following is mentioned by the *Brit. and Col. Drug.* as an efficient test for such alterations: Dissolve 2 grammes of the suspected substance in 50 grammes of cold distilled water. Throw down tannins, gums, alkaloids, etc., with solution plumbi subacet.; collect, and wash the precipitate. Mix the filtrate and washings, and remove the lead salts by a current of sulphuretted hydrogen. After filtering and washing the lead precipitate, it is evaporated, if necessary—though generally this operation is superfluous where the adulteration is of any magnitude—and mixed with an equal volume of strong alcohol. If the extract contained dextrin, it is thereby precipitated, and may be collected and weighed. A small proportion of salts insoluble in alcohol will be associated with the dextrin, but these may be ignored in approximate determinations.

Syrup of Tolu.—The Swedish pharmacopœia prescribes the following method of preparation: 30 parts of balsam tolu are by degrees dissolved in 100 of rectified alcohol, filtered, and poured into 2,000 parts of boiling water, and well stirred. Permit to stand for two to three days, filter off the fluid, and without the application of heat prepare with 1,900 sugar a syrup tolu, which is perfectly clear, has a strong odor, and an agreeable taste. The syrup is rather thin, however; it would be better to use 2,500 of sugar.—*Chem. and Drug.*

Cosmetic uses of Glycerin.—J. S. Charles writes to the *Scientific American* on the usefulness of glycerin and enumerates the following:

As a dressing for ladies' shoes it renders the leather soft and pliable without soiling garments which come in contact.

For excessive perspiration of the feet one part of burnt alum with two parts of glycerin should be rubbed on the feet at night and a light, open sock worn. In the morning the feet should be washed with tepid water.

For bunions and corns equal parts of Cannabis Indica and glycerin should be painted on the surface and covered with canton flannel.

For the face, oatmeal made into a paste with 2 parts of glycerin and 1 of water may be applied at night under a mask as a complexion improver.

As a supplement to a bath 2 oz. of glycerin in 2 quarts of water will render the skin fresh and delicate.

For coughs, 1 to 2 tablespoonfuls of glycerin in pure rye whiskey or hot rich cream will afford almost immediate relief.

For consumption, 1 part of powdered willow charcoal in 2 parts of glycerin is a panacea.

For diseased and inflamed gums, 2 parts of golden seal, 1 part of powdered burnt alum, and 2 parts of glycerin, rubbed on at night, after first removing any tartar.

Aluminium is coming into use as a material for dental plates. It is nearly as light as rubber; but little more than ⅛ the weight of gold; has neither odor nor taste; is not affected by the elements of food or the secretions of the mouth and costs, bulk for bulk, about ⅛ the present price of silver.

Lipanine—A Substitute for Cod-Liver Oil.—Mr. Mering, starting with a theory that cod-liver oil owes its superiority to other fatty oils to its richness in oleic acid—white oil contains from 0.18 per cent to 0.71 per cent, and brown oil 2.54 per cent to 5.07 per cent—the author has tried experiments with a mixture of olive oil (100 parts) and oleic acid (6 parts), to which he has given the name of lipanine, and to which he attributes the following advantages;

Lipanine would have no disagreeable taste and would be perfectly digestible, because of its high emulsive power, oleic acid saponifying with the alkalies of the bile and pancreatic juice. For this reason it could be administered for long periods in large doses without injury to the digestive faculties. In fact, M. Mering reports that for a period of six months he administered this remedy to forty patients, of whom thirty were children, and that all took it without repugnance and without subsequent ill effects. The dose varied from one to four teaspoonfuls, according to the patient's age, and this was continued from six weeks to three months. Most of the patients were scrofulous or rickety, some consumptives or diabetics. All of them under this treatment increased in weight, their general condition improved, their strength returned, and these good results were obtained also among a great number of children in charge of Professor Kohts. In a word, these effects would appear absolutely comparable with those obtained with cod-liver oil, but the advantages of lipanine in its freedom from taste, easy toleration by the stomach, and capability of administration in the hottest summer weather are equally obvious.—*Med. News*, from *Rev. Scient.*

Fertilizer for House Plants.—Potassium carbonate, potassium phosphate, magnesium carbonate, sodium silicate, of each 1 part; potassium nitrate, 2 parts; sulphate of iron, 3 parts, in 2,000 parts of water. A little of this solution poured occasionally about the roots of plants is said by the *Droguisten Zeitung* to greatly favor the growth of house plants.

Pure Quinine Salts.—C. F. Boehringer & Sons, of Waldhof, near Mannheim, now turn out, besides the commercial quinine salts, a series specially made from "pure" sulphate of quinine. The latter, as is well known, is prepared by starting from the crystallized bisulphate of quinine, which, when crystallizing, leaves all but traces of other accompanying alkaloids behind. The new *pure* quinine salts possess the same crystalline form as the usually commercial varieties.

[As the price of these *pure* quinine salts is but little in advance of that of the ordinary salts, in which the amount of secondary alkaloids sometimes rises to 15 per cent and more, the time will surely come when the pharmacopœial requirements will exclude any but the *pure* salts.—ED. AM. DR.]

Tight Corks.—Mr. Bousquet, of Bordeaux, recommends as a good method of cleaning and preserving corks, the following process [which will also make them practically air and water-tight.—ED. AM. DR].

Put the corks in a steam or water-bath until the "mildew" is removed. Then, while they are hot, immerse them in a dilute solution of albumen (1 pound of dry albumen to 160 pints, U. S. measure, of water). Fish-glue may be substituted for albumen, especially when cork-slabs are treated. For this purpose, dissolve 2 lbs. each of fish-glue and of salicylic acid in 25 gallons of hot water and plunge the corks or cork-slabs into it. When the water has become cold, put the corks in a solution of tannic acid (containing 7 oz. in 25 gallons) and dry them at a gentle heat.—*Chem. and Drugg.*

Modified Tincture of Ipecac and Opium, U. S. P.—Wm. H. Clark, of Madrid, N. Y., finding that this tincture, as made by the officinal process, is liable to ferment, owing to deficiency in alcohol (17.75% of absolute alcohol, by weight), uses strong instead of dilute alcohol, which gives a percentage of 20, by weight, of absolute alcohol and avoids any trouble from this source.—*Amer. Journ. Pharm.*

Innocuousness of Boric Acid.—Dr. Gaucher concludes from experiments on animals that men would have to take 75 grammes of boric acid in 24 hours to get toxic effects. To several tuberculous patients he gave 1 gramme daily. After a few days of treatment the fœtor of the sputum disappeared, and in two cases the general condition was improved. He also found it beneficial in cystitis. It did not disturb the stomach.—*Amer. Journ. Pharm.* from *Rép. de Pharm.*

Clarifying Wine of Gentian.—Mr. Vigier, of Paris, says that wine of gentian, which is very apt to have a muddy appearance, can be quickly clarified by adding about 1 part per 1,000 of carbonate of magnesium, shaking it, and then filtering. In a discussion on this subject, Mr. Crinon quoted Porteo, a good authority on wines, as saying that this cloudiness is due to a combination of the vegetable albumin of the gentian with the red coloring-matter of the wine and that the addition of tannin, which separates the albumin at once, is preferable to the use of carbonate of magnesium.—*Chem. and Drugg.*

Dehydrating Lard.—In order to deprive lard or other fatty substances of accompanying water—and it is well known that lard, for instance, may be made to contain a very considerable proportion of water—it is recommended to add to the melted lard a sufficient quantity of effloresced and dried sulphate of sodium (Glauber's salt), which will combine with the water and form an aqueous layer at the bottom.

In place of dry sulphate of sodium, dry chloride of magnesium may be used if this can be readily obtained.—*Polyt. Centralbl.*

Note on Peanut Oil.—It has heretofore been held that the lowest melting fatty acid existing in peanut oil was a peculiar one, differing from the fatty acids found in other vegetable oils, and was designated as hypogæic acid. Ludwig Schoen has recently had occasion to examine peanut oil pressed from seeds by himself, and he finds, as the result of very detailed analyses reported in the *Ber. d. D. Chem. Ges.*, 1888, 878, that the supposed hypogæic acid is a myth, only the common, well-known oleic acid being present in the oil, aside from the usual fatty acids of higher melting points.

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EDITORIALS.

FROM time to time we have propositions to adopt some surer mode of writing prescriptions or of expressing the quantities of ingredients to be used, and it is often remarked as an argument in favor of the novel scheme that it is calculated to lessen mistakes by the prescriber and dispenser. There can be no doubt that *any* method, so long as it is generally understood, would lessen the liability to mistakes, provided prescriptions in which it is adopted are properly written, and in this, we believe, lies the gist of the whole matter. What is needed at the present time is not an improvement in method so much as an improvement in chirography, and the ingenious person who will invent a method for obliging doctors to write prescriptions in a way that will enable them to be read is the one whose coming is longed for.

We would like to see a general movement, on the part of pharmacists, having for its object an attempt to induce physicians to abandon the use of abbreviations, the use of the genitive, and the employment of Latin directions to the dispenser. Uncertainty as to the proper termination to be given to the Latinized name of a remedy is the reason why the custom of abbreviating the name has grown to be the rule, and the writing of the whole name the exception. There are excellent reasons why the use of Latin for the names of articles used in prescriptions should continue, but there is no reason why these names should not be written out in full. Theoretically it is very nice to understand that the ℞ is to be taken to mean "Take," and that the titles following it are to be put in the genitive, but practically it is of no value. Indeed, it is really of harm, since, as above remarked, it leads to abbreviating the names to avoid an exposure of ignorance of what the proper Latin for the genitive should be. If, on the contrary, every physician expressed the title of each ingredient in the nominative, writing it out in full, just as it stands in the pharmacopœia or dispensatory, who would have reason to complain? Certainly not the pharmacist, neither would the patient, neither would the foreign reader of our medical literature. The only one who would be likely to object would be a lazy doctor, and objectors of that class will always find fault with anything which in any way threatens to disturb their shiftless lives, without regard to its importance as affecting the lives and welfare of others.

There is quite as little sense in attempting to give directions to the dispenser in Latin as there is in the pretense that is made of using the genitive. These should be written out plainly in English, and so much as is desired to be put on to the label should be so indicated.

The time has passed for hocus-pocus and mummery, for wearing professional garments and wigs, carrying gold-headed canes, and concealing the nature of medical directions in mongrel Latin, and it is quite time that the sentiments of the general public should be enlisted to prevent the writing of prescriptions which are enigmas for pharmacists, to say nothing of the non-professional person of average intelligence. It is time that the person for whom a prescription is written should refuse to accept from a physician an illegible scrawl upon whatever scrap of paper comes first to hand, in the belief that a medical prescription is something which requires a special education on the part of any one who may desire to read it.

Every physician cannot be expected to be a genius, but no man is fit to be a physician who cannot read and write, or who cannot write an order for the compounding of a poisonous mixture in a manner which will admit of its being read by others without the possibility of mistake.

With all the progress that has been made in medical science, this feature of the art of medicine is no better to-day than it was a century ago; indeed, we doubt very much whether the generality of prescriptions of the present day would compare favorably with those of a century since, as regards their chirography, and we do not see how it will be otherwise unless it is brought about by a popular movement.

Illy-considered attempts have been made several times, in this and other States, to compel the use of English titles in writing prescriptions. This is, of course, impracticable, but, aside from the use of Latin for scientific names, the enactment of such a law is a thing to be desired. Rather let us have a law *obliging* physicians to use the recognized scientific titles of remedies, and obliging them to write them out in full, without abbreviation, in their prescriptions; and prohibiting the use of anything but the commonly used language of the locality for any directions, remarks, or other matter contained in the prescription.

College of Pharmacy of the City of New York.—The programme for the coming summer and winter course shows a number of important changes, both in the personnel of the instructors and in the method of instruction.

Professor Chandler, now connected with the College, as professor of chemistry, for nearly twenty years, has been made General Director of the Chemical Instruction, both didactic and in the laboratories, and the instruction and lectures will be given by Prof. Arthur H. Elliott, Ph.D., who has been for many years Prof. Chandler's principal assistant. Prof. Chandler will deliver lectures on such topics as he will himself select. Prof. Elliott will devote his whole time and energies to the College, and will, no doubt, make the new departure a marked success. In order to carry out the modified plan of laboratory instruction, suitable alterations are being made. The lecture room of the College, well known to be one of the best in the city as to acoustics, will be provided with comfortable desk chairs, thus enabling the students to be more undisturbed and better able to take notes. The lecture course and the laboratory attendance have been materially increased in length, commensurate with the enlargement of the scope of instruction. Every thing points to a most prosperous and successful lecture season.

At the last meeting of the College, Mr. Frank F. Knapp tendered his resignation as trustee, being unable, by business engagements, to attend to the duties of the office.

Massachusetts College of Pharmacy.—The Association of Alumni gave a dinner to the graduating class, on the 25th, at the Hôtel Vendome in Boston. The officers of the Association for 1888 are: President, M. L. H. Leavitt; vice-presidents, H. A. Baker, M. J. Wiltse; secretary, L. W. Griffin; treasurer, J. G. Godding; auditor, B. L. Spiller.

Ohio Pharmaceutical Association.—The next meeting will be held on the 12th inst., at Columbus. The committee having charge of arrangements advise that a through ticket be bought at the nearest available point to Columbus, and that a certificate be obtained of the ticket agent. The indorsement of this certificate by the secretary will entitle the holder to the advantages to be derived from reduced rates on return tickets. Mr. H. C. Cook, of Columbus, is the local secretary.

Albany College of Pharmacy.—The officers of the Alumni Association for the ensuing year are: President. Chas. N. Gilbert; vice-presidents, F. D. Ostrander, C.

Stewart; secretary, W. A. Livingston; treasurer, E. F. Hanling; historian, W. H. Conley; executive committee, F. J. Smith, L. Sautler, Jr., F. M. Clement.

The prizes awarded at the last commencement were: Seneca S. Smith, $25, for best general examination in senior class; James Gardner, $20, for best thesis; Comstock, $20, for best general examination in junior class.

The Australian Chemists' Review is the title of a new 16 page 4to. monthly, edited by Dr. Hodgson, and published in Croydon, Sydney, N. S. Wales.

Jules Emile Planchon, whose death in Paris on the 3d of April was mentioned in our last issue, was the brother of the Director of the Paris School of Pharmacy. He was born at Ganges (Hérault) in March, 1823, and studied first at Montpellier, devoting himself specially to botany and natural sciences. Having obtained in 1844 the degree of Doctor of Sciences, he went to England to perfect himself, and had from 1844 to 1849 charge of the Kew Botanical Gardens herbarium. Thence he was successively a professor at the Ghent Institut Horticole (1849–51), the Nancy School of Medicine and Pharmacy (1851–53), and finally the Montpellier College of Pharmacy, of which he was the director till within a few years. At one time (1873) he was sent on a government mission to America to study phylloxera. A corresponding member of the Academy of Sciences, Academy of Medicine, and of many British and American societies, he was at his death the Director of the Montpellier Jardin des Plantes. As a botanist, M. Emile Planchon's name is well known everywhere, and his works and papers were many and important.

CORRESPONDENCE.

The Detection of Morphine.

Editor of the American Druggist.

There have been lately published several "analyses" to the effect that a certain profusely advertised proprietary preparation contains a considerable amount of morphine, while other "analyses" flatly contradict that statement, and it seems as if the celebrated "hopeine" case, which two years ago created so much excitement in Europe, would thus find a pendant on this side of the Atlantic.

There can be no doubt that the exposure of any such fraud is highly commendable, but it should be done in a thoroughly scientific manner not open to any criticism. This has, however, been sadly neglected on both sides of the new controversy.

There has, on the one side, as far as the record goes, no *pure* morphine been separated and identified, with the exception of a precipitate having the appearance of "crude" morphine and responding to a few morphine tests. All authorities agree that the different morphine reactions are only then of value when produced by that alkaloid in its *pure* state, which it is extremely difficult to obtain from a preparation that probably contains some other alkaloids or organic substances which in their reactions may correspond with morphine. It is not necessary to go here into the details of the most approved methods of purifying morphine obtained in a crude state, for every chemist who attempts to detect morphine in a liquid of complex organic nature ought to know all of it; but it is necessary to call attention to the indefinite wording of analyses purporting to establish serious frauds. They should at least show that the "analyst" is fully conversant with the subject treated upon, so that the conclusion arrived at may be shared by others; but it would be sheer foolishness to draw any conclusion from the vague statement that a substance resembling "crude" morphine has been subjected to some morphine tests.

On the other side, the assertion that *no* morphine at all has been found should be accompanied with a brief statement of the "modus operandi" by which that fact has been established beyond any doubt.

DR. C. H. FRINGS, Chemist.

[*Note by Ed. Am. Drugg.*—We agree with our correspondent as to the difficulty of separating morphine from accompanying organic principles, so as to obtain the color reactions in a condition which will admit of no doubt of the identity of the alkaloid. But we believe that the weight of evidence, presented in the case of the proprietary article alluded to by our correspondent, is at present altogether on the side of the experts who reported the existence of morphine.]

Strophanthus.

To the Editor of the American Druggist.

SIR:—No doubt you will have seen a very interesting book lately published by Mons. Blondel, of Paris, on Strophanthus. A great deal of his information and facts have been based on what I have furnished him with. His experiments are leading to such important results that I have arranged with him not to publish anything further until he has visited England. To-day he has come to stop with me at Sydenham, where he will examine the different live specimens of strophanthus plants, and also the numerous specimens which could not be conveniently transported to Paris. With his first day's work he expresses himself "more than amazed" with the information he has got here. Suffice it to say, my advice to your readers is much as it was to Mons. Blondel, not to form any conclusion at present as to which strophanthus is the best, and further what the names of the different varieties are.

When Mons. Blondel has finished his work we shall then have the true chemical values of the different seeds and also roots and barks to guide us, as to their properties. I give you one instance to support these remarks. From a pinch of seed sent by the African Lake Company, I put before Mons. Blondel several plants grown from this "pinch of seed," and he could not believe they were all strophanthus, owing to their remarkable differences in foliage, until I turned the roots out and showed him that they had very near the same formation. The leaves and stems were entirely dissimilar, although the plants came from one pinch of seed. This has been equally the experience at the Botanical Gardens in Scotland. The Director had sown the seed received last year.

There is so much work waiting to be done that I should esteem it a great favor if any of your readers could forward me reliable information and samples of the different varieties of the coca. I want the large leaf variety, yielding a large quantity of cocaine. The leaf is as large as that of the Bay Tree *Laurus Nobilis*. I have now five varieties.

Yours truly,

THOMAS CHRISTY, F.L.S.

LONDON, April 28th, 1888.

Revision of the Pharmacopœia.

THE Committee of Revision of the Pharmacopœia has determined to employ the time intervening between now and the next convention (1890), in compiling, from the literature which has appeared since 1882, a report on all subjects likely to be of practical use for their successors, in preparing a new edition of the U. S. Pharmacopœia. In addition, it has been resolved to ask the active assistance of *every State Pharmaceutical Association*, for the purpose of collecting reliable *statistics* regarding the frequency with which the various drugs, chemicals, and preparations, recognized by the present pharmacopœia, are prescribed or legitimately used. The object of these statistics is to furnish to the next Committee of Revision trustworthy data from which to decide what shall be admitted or discarded. Another important matter which it has seemed to the committee should be decided before the next convention meets, is the system of *weights and measures* to be employed in the working formulas of the pharmacopœia. It will be remembered that the Revision Committee of 1870 had been directed to employ *parts by weight*, and that much fault was subsequently found with them for not obeying this instruction. The Revision Committee of 1880 received the same directions, and actually complied with them, thereby affording the members of the profession an opportunity to test the system practically. Much has been written since then, both in favor of and against it, and a good deal of uncertainty still exists as to which side has the best of the argument. It is expected that a discussion of this question—particularly so far as it affects preparations which are *prescribed or administered by measure*—and a definite expression by each State Pharmaceutical Association, as representing the collective views of the pharmacists residing in each State, will enable the next Committee of Revision to make a satisfactory choice of methods.

For the purpose of facilitating the collection of statistics, the Committee of Revision has caused a complete list of pharmacopœial titles to be set up and electrotyped (see note 1), from which every State Association may have such a number of copies printed as it may require *at cost price* (see note 2).

In compliance with the directions of the Committee of Revision, the undersigned chairman respectfully requests State Associations to appoint a Committee on Pharmacopœia, to take charge of the collection of statistics and of any other kindred subject that may be referred to them by the association, and that such committee be instructed to forward a synoptical table of the results to the Chairman of the Committee of Revision, etc., before January 1st, 1889.

Regarding the system of *weights and measures*, it is requested that the result of the deliberations, or the vote of each State Association, be transmitted to the Chairman of the Committee of Revision, etc., as soon after its annual meeting, to be held in 1889, as possible—at all events, before January 1st, 1890.

CHARLES RICE,
Chairman of the Committee of Revision and Publication of the Pharmacopœia of the United States of America.
Post-office address: Bellevue Hospital, New York.

April 24th, 1888.

NOTE 1.—Specimen copies of the List of Pharmacopœial Titles will be sent to the Secretary of each Association, and to the Chairman of the Committee on Pharmacopœia, at as early a date as possible.

NOTE 2.—Orders for copies, drawn by the proper officers authorized therefor, should be sent to the Chairman of the Committee of Revision, etc., at the above-given address. The price per 100 copies will be about $6.75.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,159.—**Creasote or Creosote?** (C.)

The article our correspondent refers to is a paragraph in a recent issue of the *Chemist and Druggist*, in which the spelling of creasote is discussed. The Edinburgh Pharmacopœia used to spell "creazotum;" this was altered by the London Pharm. to "creasotum." The U. S. Ph. adopted this likewise, but the Germ. Pharm. selected "kreosotum." The *Chem. and Drugg.* points out that Roscoe and Schorlemmer quote a passage from Reichenbach's original memoir, in which he states that he formed the word from *kreos* (the contracted genitive of *kreas*, flesh) and *sozein*, "to save," in allusion to its extraordinary power of preserving animal matters from decay. And the editor of the *Chem. and Drugg.* believes that the form *creosote* is the more correct one.

Being asked our opinion on the subject, we have to say that while *crea-sote* is defensible on the analogy of such Greek compounds as *krea-dosia* "meat-bestowal," *krea-nomia*, "meat-distribution," etc., which occur in the literature, yet the form with *o*—as representing the genitive—is much more common. In earlier authors the *o* is short (*o*); in later ones the long *o* (*ω*) is more usual. Thus we find: *kreo-boros* "meat-eating," *kreo-poles* "meat-dealer," etc., etc. We, therefore, are likewise in favor of returning to the former spelling: *creosote*.

No. 2,160.—**Guenzburg's Reagent** (E. S. F.).

This is also known as *phloroglucin-vanillin*. It is prepared by dissolving 2 Gm. of phloroglucin and 1 Gm. of vanillin in 30 Gm. of alcohol.

If a drop or two of any liquid containing hydrochloric acid be mixed with a drop of the above reagent, on a small porcelain capsule or other white surface, and a gentle heat then applied, a crimson red tint will develop itself along the margin of the liquid, which will become spread over a larger surface when the liquid dries up. This reaction takes place even when the acid is very dilute (up to 1 in 20,000). Lactic acid does not produce the reaction; hence it may be used to demonstrate the presence or absence of hydrochloric acid in the gastric juice, and it has been first recommended for this purpose by Dr. Germain Sée.

No. 2,161.—**Banishing Ants, Moths, and Bed-bugs**, etc. (Nevada).

The following practical hints, partly derived from others, partly tested by our own experience, may prove useful to our correspondent.

Ants.—These are usually very obstinate and persistent in maintaining a footing when they have once gained it. The best method to get rid of them is the following. Upon a small board, of convenient size to be quickly carried about, spread a thin layer of syrup, and put the board where the ants are apt to congregate. When as large a number as can be expected have gathered, the board is quickly carried away, and the ants destroyed. This is repeated as long as any considerable number make their appearance. When they are becoming less numerous, the syrup may be poisoned, so that the ants may carry the poison to their nests. If the nests can be found, this may be rendered uninhabitable for them by insect powder.

Bedbugs.—A tincture prepared from best insect powder may be applied with advantage to all places where bedbugs have been found to locate themselves. Tincture of colocynth has also been used for this purpose. The most efficient remedy which we have found is a solution of bichloride of mercury in glycerin, about 1 in 50. This must be applied with care and judgment, being brushed as a thin layer into the cracks and recesses of the bedsteads, etc. It should not be used where there are children or other persons about who do not understand the nature of the substance. In barracks—such as our correspondent appears to allude to—it would be quite efficient and comparatively harmless.

Moths.—When moths have once permanently invaded a piece of furniture, furs or heavy woven fabrics, it is next to impossible to destroy their larvæ. But it is quite easy to protect untainted material from their inroads. This is best accomplished by packing the fabrics, if this is possible, into tight boxes, a layer of *camphor* or of *naphthalin* being put between each two layers of the fabric. The camphor may be used in pieces of about the size of a walnut, and wrapped in paper. The naphthalin is best reduced to a coarse powder, and placed between a couple of sheets of paper, as a thin layer.

No. 2,162.—**Manufacture of Acetanilid (or Antifebrin) and Antipyrine** (J. R. S.).

It will not pay you or any one else to manufacture acetanilid (or antifebrin) on a small scale, as it is one of those substances which can only be made profitably in aniline works and on a large scale. Aniline forms one of the necessary ingredients of the process, and you would have to purchase your aniline from your own competitors, who have, moreover, better facilities to work it up and to *dispose of the waste products* economically than you have. However, we will briefly describe the process: 100 parts of *pure* aniline (free from toluidine) are boiled with 100 parts of glacial acetic acid, in a vessel provided with a reflux condenser, for several days, until a small sample of the mixture, when dropped into dilute solution of soda, ceases to separate free aniline, which would be recognized by its odor. When the whole of the aniline has been found to have entered combination, the mixture, now containing acetanilid and acetic acid, is subjected to fractional distillation. At 120° C., the acetic acid is distilled off, and at 295° C., the acetanilid distils over. On cooling, the distillate congeals to a crystalline mass, which is purified by recrystallization from boiling water, with the intervention of animal charcoal. As "acetanilid," the product can be sold and used just the same as "antifebrin," which name has been given to it by A. Cahn and P. Hepp, who discovered the fact that the long-known acetanilid had antipyretic properties. We consider the principle upon which proprietary rights can be granted to a previously well-known and non-patented article, so as to protect it when disguised under another name, as unjustifiable and against public policy. There is such a thing as patenting the *new application* of an existing non-patented article. Had this principle been applied in the case of acetanilid, then the patentees would have to word their claim thus:

"Patent claimed for the application of the [long-known substance] acetanilid, to the treatment of the sick."

Probably it was deemed too selfish and mercenary to appear to exact a toll from the sick and infirm, by making the claim as stated. Consequently, another plan was adopted, namely, to rechristen the article, to have the rechristened article manufactured by a special firm, and to discountenance and discourage the use of the unchristened article, though this may be just as pure as the other.

Antipyrine stands on a different ground. This substance was not known before its existence as well as its antipyretic action was announced by the discoverer, and under the circumstances, he had a perfect right to patent it. But the manufacture of this compound is a very complicated and difficult operation, which requires ingredients and apparatus only available in works specially constructed for the purpose. Of course, on the small scale it could be made also with simple apparatus, but the loss, by secondary products that could not again be utilized, would be so great that it would not pay. The stages of the operation have been described on page 164 of our volume for 1887.

No. 2,163.—**Raspberry Vinegar** (W. S. F.).

We take the following from our files:

1. Mix 1 pint of raspberry juice (from fruit) with 2 pints of best white wine vinegar; allow to stand a few days, and strain, if necessary.

2. To 3 pints of white wine vinegar add 3 pints of ripe raspberries, bruised, and macerate for 24 hours. Then press, strain, and for each pint of strained liquid add 1 pound of sugar. Boil, skim, and cool the mixture, and to each pint of product add 2 oz. of brandy (Dick).

No. 2,164.—**Salicylic Acid as a Preservative** (S. S. U.).

We are asked the following question:

"Does salicylic acid prevent 'grape wine' or other fermenting liquids from undergoing fermentation in a warm temperature, and cause it to retain its bouquet in partially empty vessels?"

The average quantity of salicylic acid necessary to be added to pure grape wine to prevent further fermentation is about 1 oz. to 75 gallons. This amount will usually be sufficient, even in a warm temperature, provided care be taken that the wine is not exposed with too large a surface to the open air. In partially empty vessels, the protection afforded by salicylic acid is rather uncertain. It all depends what kind of microscopic germs (bacteria, fungi, etc.) the air which has access to the liquid will bring to it. Most or all of these may be of that kind which lose their vitality in contact with the salicylated liquid, or some may retain their vitality and at the proper time begin their insidious growth at the expense of the wine. Supposing the wine to have been properly fermented, mixed with salicylic acid, and to be contained in a cask quite full. If now the bung-hole be secured with pure cotton (previously sterilized by heat) and securely fastened, and if the access of micro-organisms to the contents of the cask be otherwise prevented, then the wine, etc., will keep perfectly.

No. 2,165.—**Ink Eraser** (J. M. H.).

We have answered a query regarding ink erasers in last number. See answer to query 2,141 (page 96).

No. 2,166.—**"Elixir of Guarana and Celery"** (Concord).

There is no standard formula for such a compound. The National Formulary, which is on the point of being issued, contains a formula for elixir of guarana which is as follows:

Fluid Extract of Guarana	3 fl. oz.
Aromatic Elixir	3 fl. oz.
Compound Elixir of Taraxacum	10 fl. oz.

Mix them, allow the mixture to stand a few days, if convenient, and filter.

Now if there is any fluid extract of celery root or of celery seed to be combined with the above, this may easily be done. In this case, probably the following proportions might be suggested:

Fluid Ext. Guarana	2 fl. oz.
Fluid Ext. Celery Root (or Seed)	2 fl. oz.
Aromatic Elixir	2 fl. oz.
Comp. Elixir of Taraxacum	10 fl. oz.

No. 2,167.—**Collecting Medicinal Plants** (E. S. C.).

Since the collection, garbling and sorting of medicinal plants or parts of plants has become to a large extent monopolized by certain houses, the necessity for knowing the proper season when to gather each one has become so much less urgent that the pharmaceutical literature of this country has no recent work to offer on the subject. The most useful and practical directions for collecting such plants or their parts are given in several issues of the "Apothekerkalender," for inst., on page 89 of that for 1888. (Oskar Schlickum, Apothekerkalender, 16°, Leizig). These pharmaceutical almanacs are very useful, and contain a variety of practical information.

No. 2,168.—**Cracking of Necks of Shop-Bottles** (Several subscribers).

We have had our attention recently called by several of our friends to a peculiar fatality affecting shop-bottles which must have occurred quite as frequently in former times, but which does not seem to have been discussed in public. That is the frequent cracking of necks of shop-bottles. We have been shown a number of such, and have been asked for an explanation of the "phenomenon."

If we may judge from the bottles we have examined, and from the reports we have received, this cracking of necks seems to occur more frequently in the case of those bottles which contain an aqueous liquid. The nearer to purity the water is, that is, the less material it holds in suspension, the more common does the accident seem to occur. We have seen it happen with bottles containing aromatic waters, saline solutions, solutions containing lime, soda, potassa, etc., but comparatively rarely with bottles containing tinctures and highly volatile liquids. On reflection, and taking into consideration the conditions under which the accident occurs, we have formed the following theory:

Stoppers of shop-bottles have different shapes. Some are quite tapering in the body; in others, the sides are nearly parallel. They are usually ground rather coarsely, and the inner surface of the neck of the bottle always has the same "grain" as the stopper fitted for it. When a bottle in which the stopper is inserted, expands by heat, its neck, of course, expands likewise, and, as the thick stopper cannot expand at an equal rate in the same time, it *may* sink, if it is tapering, by its own weight, a minute distance further down the neck than it was originally situated. When the bottle cools again, and the glass contracts, the neck cannot contract in proportion; if the stopper has sunk deeper, and if the pressure becomes too great, or unequal (from inequality of contact), the weaker body, that is, the neck of the bottle, will give way. If the stopper was not very tapering, but had nearly parallel sides, this accident will not be so likely to occur. Nor will it readily occur if the ground surfaces of neck and stopper are very smooth, and afford a chance of sliding, particularly if the surfaces of neck and stopper are in uniform contact. But it seems to depend also upon the contents of the bottles, whether the accident is liable to occur or not. If the contents are quite volatile, as f. i., alcoholic liquids, ether, etc., any increase of temperature will cause the evolution of volatile vapors of a corresponding tension, which tension may not only be sufficient to prevent the stoppers from sinking, but may even drive the stopper upward in jerks, or project it completely from the neck, as will often have been noticed by many of our readers. If the contents, however, are aqueous or nearly so, the tension of the aqueous vapor eliminated may not be sufficient, at a moderate elevation of temperature, to project the stopper or even to keep it from sinking. For this reason, aromatic waters, which are nearly pure water, may, even theoretically, be expected to cause the accident oftener than other liquids.

Now as to the remedy. We believe that if the ground surfaces were finer, or if they could be made to slide upon each other, the trouble could be almost or entirely avoided. We would advise, in the case of all liquids which exert no solvent action on *paraffin* or *vaseline*, to coat the body of the stopper with a very small amount of either of these substances. It is not necessary to smear on a thick layer. Just enough to remain scarcely perceptible to the fingers will be sufficient. And as the accident appears to be so rare with volatile liquids, particularly such as may exert a solvent action upon the two substances named, it will not be necessary to coat the stoppers of these bottles at all.

We would be pleased to learn whether our explanation is assented to, and whether the remedy suggested by us is efficacious.

No. 2,169.—**Material to Resist Fusing Phosphoric Acid** (Pittsburg).

This correspondent is desirous of finding some material which shall resist the action of fusing phosphoric acid. He has tried everything in the shape of available laboratory utensils, but finds that even platinum vessels are soon attacked.

We can give but little encouragement to our correspondent, as he has encountered a problem which has been a "sticker" to many before him. At the present time, the discovery of some material which would resist fusing phosphoric acid would be a most profitable matter, as it would permit the practical application of Jurisch's method of producing ammonia from chloride of ammonium by means of fusing phosphoric acid, without waste of the latter.

In analytical operations, phosphoric acid *may* be fused by itself (though this will be but rarely required). But afterwards it will be necessary to ascertain whether the acid has taken up any of the elements of the vessel in which it was fused.

No. 2,170.—**Plumbate of Potassium and Plumbum Causticum** (P.).

When a soluble salt of lead is precipitated in aqueous solution, by potassa or soda, the precipitate consists of hydrated oxide of lead and is soluble in an excess of the precipitant. The resulting solution contains the compound K_2PbO_2 (or $Na_2Pb.O_2$) which may be termed plumbate (or plumbite) of potassium (or sodium).

In order to obtain a definite compound free from impurities, proceed as follows:

Dissolve any desired quantity of nitrate of lead in water and precipitate the solution with caustic potassa, until a drop of the liquid, transferred to a piece of red litmus paper, produces a blue stain, showing that all the lead has been precipitated and alkali begins to be in excess. Wash the precipitate about six times by decantation with hot water, then transfer it to a filter and continue the washing until the soluble matters are extracted. Transfer the moist magma to a beaker, apply the heat of a water-bath and add to the mass successive portions of a moderately concentrated solution of potassa, under constant stirring, until nearly the whole (but not all) the precipitate is dissolved. Now filter, and evaporate the liquid to whatever degree of concentration may be desired. If this is carried too far, both the oxygen of the air and the carbonic acid will affect the product. Some red oxide of lead will form as well as carbonate, and the oxide of lead will be insoluble when water is used to redissolve the compound.

It has, however, been ascertained that the presence of the secondary products just mentioned does not interfere with the therapeutic action of the true plumbate of lead remaining. Hence the solution may be evaporated to dryness, and afterwards fused, either in a porcelain or a platinum crucible, until a gray, or reddish-gray mass remains.

A lower-fusing preparation, called "*Plumbum causticum*" has been proposed by Gerhard. It is prepared as follows:

Litharge, in very fine powder	20 parts.
Caustic Potassa, fused	80 "

Mix and reduce them to powder, place the mixture in a porcelain crucible, cover it and heat gradually until the mixture fuses and the reddish color changes to gray. Then pour it into moulds.

No. 2,171.—**Marking Ink** (M. M.).

Among the large number of formulæ for marking inks, the following is perhaps the most economical:

Sulphate of Copper	1 troy oz.
Nitrate of Silver	¼ "
Water of Ammonia	1¼ fl. oz.
Bitartrate of Potassium	150 grains.
Dextrin	150 "
Sugar	75 "
Soda	150 "
Lampblack	15 "
Distilled Water	2½ fl. oz.

Dissolve the Sulphate of Copper in the Water of Ammonia, and the Nitrate of Silver in enough of the Distilled Water. Then mix the two solutions. Dissolve the Soda, Dextrin, and Bitartrate of Potassium in the remainder of the Water, and finally incorporate the Lampblack.

The sulphate of copper may be replaced by nitrate of silver, which renders the compound more expensive, and more intense in color. But even when the copper salt is employed the product is satisfactory.

The ink may be used like ordinary ink, and applied to any fabric without previous preparation. The place to be marked should, however, first be ironed over, and when the ink is dry, a hot iron should be passed over it.

No. 2,172.—**Liquid Franconia** (C. H. B.).

We are not personally acquainted with this preparation. It isa proprietary article made in Fulton, N. Y., and (as you say) recommended for chapped hands. As we do not know its composition we cannot give a formula to produce a product like it. Perhaps some of our readers can.

No. 2,173.—**Elixir of Hydriodate of Quinine** (G. B. N.).

An Elixir of Hydriodate of Quinine has occasionally been prescribed by some physicians of Brooklyn. The following formula was devised by Mr. L. F. Stevens:

Sulphate of Quinine	72 grains.
Iodide of Potassium	160 "
Alcohol	2 fl. oz.
Compound Elixir of Quinine	4 "
Aromatic Elixir	enough to make 16 "

Triturate the Sulphate of Quinine with the Compound Elixir of Quinine, add the Iodide of Potassium and Alcohol, and lastly enough Aromatic Elixir.

To make a plain Syrup of Hydriodate of Quinine will only be possible if a sufficient quantity of an acid, preferably hydriodic acid, is used to aid solution. But the above elixir seems a better preparation.

No. 2,174.—**Borocitrate of Magnesium** (F. M.).

This compound has recently been in somewhat increased demand, probably owing to the favorable reports made regarding its solvent power over calculous deposits, and its comparative innocuousness. The salt, as well as the solution of the salt, may easily be made in the following manner:

1. *Borocitrate of Magnesium.*

Carbonate of Magnesium	1 part.
Citric Acid	2 parts.
Borate of Sodium	2 "
Water	3 "

Dissolve the Citric Acid in the Water at a boiling temperature, then add the Carbonate of Magnesium and afterwards the Borax. Filter and concentrate the solution by evaporation, and spread it upon plates of glass or porcelain, so that the salt, when dry, may be obtained in scales. Or, evaporate the solution to dryness, and reduce the mass to powder. Keep it in well-stoppered bottles.

Both citric and boric acids being tribasic, it would require, theoretically, 3 molecules of magnesia to saturate both acids. The actual quantity above directed, however, saturates only two-thirds of the acids, thus rendering the product agreeably acidulous.

2. *Solution of Borocitrate of Magnesium.*

Carbonate of Magnesium	1000 grains.
Citric Acid	2000 "
Borate of Sodium	2000 "
Water	enough to make 52 fl. oz.

Dissolve the Citric Acid in 8 fluidounces of Water at a boiling temperature, then add the Carbonate of Magnesium, and afterwards the Borax. Filter, and then add enough water to make the solution measure 52 fluidounces.

The solution contains about 10 grains of the dry borocitrate in each fluidounce.

No. 2,175.—**Clarifying Liquids** (Several subscribers).

Fermented liquids are generally clarified by means of isinglass. The imported Russian isinglass is best, but the domestic article, known as American isinglass, which is simply the dried swimming-bladder or sound of the hake, may also be used. 1 ounce of this, cut fine, is soaked in about a pint of the liquid, and when it is dissolved as far as possible, mix with more to make about 1 gallon. About 2 pints of this is enough for clarifying a barrel. The two pints are poured into a pail, and enough of the liquid from the barrel is poured to fill the pail about two-thirds, the contents being energetically stirred with a sort of whisk to raise a frothy heat. The whole is then mixed with the contents of the barrel, and in a few days clarification will have been effected.

No. 2,176.—**Hard Soap** (H.).

Unless you have some experience in soap-making, we fear that your first attempt to make hard soap, even when following exact instructions, will not be very successful. The best hard soap is made by saponifying tallow with caustic soda. To do this properly, the proportions between the two must be adjusted so as to saponify the whole of the fat, without leaving any great excess of uncombined alkali. It is impossible to give specific directions, as the quality of the commercial caustic soda is liable to change. But, on an average, it may be estimated that about 1 part of soda are required for 8 parts of fat. We cannot spare the space for a minute description of the soap-making process, and must refer you for this to special works on this subject, the titles of which will be supplied to you by any importing bookdealer, such as J. H. Vail & Co., 21 Astor Place, New York.

No. 2,177.—**Removal of Foreign Taste from Fermented Liquids** (S. C.).

One of our southern subscribers asks us how he may remove the burnt taste from a lot of vinegar which he has made from some "burned" molasses.

In reply we would say that there is no practical way to accomplish this. A portion, or perhaps the most of the foreign taste may possibly be removed by percolating the vinegar through coarse animal charcoal. But the operation would entail more expense than the vinegar is worth.

Another query by the same correspondent refers to the development of an acid in a fermented liquid he is preparing. We surmise this is one of the products of fermentation, but can give no reliable advice as to a remedy on the meagre information supplied to us. On general principles we should try the use of chalk, added as a milk, after fermentation has been established. But it must be used very sparingly, or the flavor of the product will be injured.

BIBLIOGRAPHY.

THE PRESCRIPTION. Therapeutically, Pharmaceutically, and Grammatically Considered. By OTTO A. WALL, M.D., Ph.G., Professor of Materia Medica and Botany in the St. Louis College of Pharmacy, . . . (etc.) . . . St. Louis, Mo., 1888.

WE have long been aware that the author, who is well known as an accomplished physician, pharmacist and botanist, has been engaged upon the preparation of this work, and our expectation that the ground would be most thoroughly covered, is fully realized. The author has not only incorporated everything that should be known by those who wish to construct, write, read, understand and dispense prescriptions correctly, but he has interlarded a large mass of historical information which renders the work exceedingly interesting. In many places he introduces critical remarks, which either point out incongruities in existing methods, nomenclature, etc., or suggest improvements. While it could not be expected that an intimate acquaintance with the Latin language could be brought about by an abstract of the grammar, such as is given in this work, yet everything that is essential for writing and reading Latin prescriptions is given in a very concise and intelligible manner, in few rules, and without quoting endless exceptions, which only frighten the beginner.

We can recommend the work as a trustworthy guide both to physicians and pharmacists, who will derive much benefit from its careful perusal or study.

THE BEGINNINGS OF PHARMACY. An Introductory Treatise on the Practical Manipulation of Drugs and the various Processes Employed in the Preparation of Medicines. . . . By R. ROTHER, Grad. of the University of Mich., Dept. of Chemistry, etc. 8vo, Detroit, 1888.

THIS book is constructed upon an entirely novel plan. The "beginner in pharmacy" is supposed to receive his lessons from his employer, who takes him gradually through the stock-room, the laboratory and dispensing establishment, and imparts to him, in connection with every drawer, package or container, the history, properties and uses of the medicinal articles contained therein. These object lessons are rendered very instructive by the author, who contrives to convey a large amount of practical information, either on the special drugs under consideration, or incidentally, on general topics. The chapters on pharmaceutical operations are also very instructive, but could have been made much more so by appropriate illustrations. A large amount of space is devoted to the discussion of "Incompatibles." This chapter is hardly adapted to the understanding of beginners, as the manner of treatment and the language used in the explanation of facts or reactions often presupposes a considerable familiarity with chemistry or physics. This is not a serious draw back, however, as it is easily overcome by an intelligent beginner, either through self-study, or with the aid of an instructor.

In the chapters devoted to "Etymology" and "Orthography," we have encountered some statements which we must take exception to. From the former we will select only one example. The author derives *hydrastis* from the "Greek *hyein*—to rain, and *dran*—to draw." This is, of course, wrong. The *d* of *hyd-r-astis*, belongs to the first part of the word, the root being *hyd* (Sansk. *ud*; English *wat-er*), or, in an expanded or secondary form *hydr*. Hydrastis may be regarded as a normally formed derivative of *hydrainein*, to wet, to irrigate. On page 326, the author makes the remarkable statement that "A grain weight is termed in Latin *grana*, being a noun of the third declension. Its genitive singular is granatis, the nom. plur. granata, and the gen. plur. granatum." By no means. There never was a noun *grana, granatis*, of the third declension. "A grain," as designation of a small weight, is *granum* (i, second decl.), and occurs also as *granus* (i, second decl.), but the former is the most common. The earliest document from which *granum*, as weight, is quoted (by Ducange, Glossar. Med. et Infim. Latinitatis. Niort., Vol. IV., 101) is dated 1289, though it occurred no doubt long before. *Grana* (æ, first decl.) and *granata* (æ, 1) also occur, but not as names for weights. "A grain," therefore, is *granum* in Latin, gen. sing. *grani*, nom. plur. *grana*, gen. plur. *granorum*.

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